COAL AGE

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Popular Stuff

DEPICTING the householder, empty coal hod in hand, enshrined on a mass of "statements" running the gamut from "no shortage" and "prices going down" to "high prices," earnestly gazing upward at the coal pile high above his head and well out of reach, the cartoonist of the *New York Evening Post* has given us a true picture of the attitude of a large portion of the hard-coal buying public.

This is the attitude assumed by not only the relatively few who thus far have not been able to get anthracite as they need it but by many other citizens who read much about coal in their newspapers and conclude that something must be wrong somewhere. We are in receipt this week of a letter from the secretary of a civic and oratorical league representing twelve leading colleges in the Middle West which propose to debate the proposition "that the United States should own and operate all the coal mines," accompanied by the inquiry "Is there a better method of remedying the evils of high prices, irregularity of employment, irregularity of production, waste and profiteering," and "Would or would not Government ownership and operation bring the desired results?" The inquiry is concluded with a statement that these good people would like to mold public sentiment aright and wish to know what the miners, the operators and the public think of this general propostion.

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People are questioning not so much the integrity of the individual in the coal industry, although that is generally blamed for what is wrong, as the fundamental proposition of whether the Government should not take a greater hand in the control of a commodity that is so basic and enters the everyday life of so many people. What many are seeking is some solution of the problem that will so regulate the individual in the industry that repetition of this year's experience will be impossible.

The householder who this year compares the price of his winter's supply of coal with that of six years ago is concerned not so much about the percentage of increase as he is in regard to total dollars and cents. It has been futile to show him that measured in percentage the increase in the cost of his coal is less than for many if not most of the other commodities that he daily uses, for the size of the bill is the all-important feature to him. When this is coupled with inability to obtain coal in the quantities he desires and at the time he most needs it the average citizen cannot be blamed for getting peeved and perhaps writing his Congressman for help.

Our answer to those who say they believe some form of federal regulation or control must be had for the coal industry for the protection of the public has been the inquiry "What would you propose?" So far we have heard no concrete proposal and have generally been answered to the effect that something must be done and it is up to Congress to find a way. It seems accepted that Senator Calder will make some sort of a proposal to Congress this winter, but because his every effort so far has been to devise destructive evidence, and he apparently has developed no tendency to work constructively, we believe that his legislative efforts will perish in the making. It is understood that his idea is that some harness must be placed upon the coal industry and that if the coal men themselves cannot devise that which will be acceptable to them and at the same time protect the public, Congress will attend to the harness making.

We cannot but hark back to the prophecy of Dr. Garfield in the spring of 1919, when, speaking to the National Coal Association annual meeting in Chicago, he told us that it was no longer a question of whether we should have some form of governmental control or regulation of the coal industry but rather what form that regulation should take. Dr. Garfield was a statesman before he was Fuel Administrator and merits a hearing more than a Senator who seems anxious to tear down one industry in order to profit another.

Education of the public in abstract matters of economics is slow and must be done at least in part, by Congressional investigation even though it be expensive. The Calder committee last week held a hearing on anthracite, going over practically the same ground covered in detail by Senator Frelinghuysen more than a year ago. There is, however, no publicity connected with a Senator's reading a printed report of a previous investigation covering the same ground. We are, nevertheless, not opposed to investigations by Congress, because even though they come to naught someone has in the process been educated. We only ask that these investigations be conducted in a spirit of fairness, with a real desire to develop the truth and help constructively.

In the meanwhile we confidently believe that the coal consumer is already getting his coal, either because he extended his reach or the coal came down, and that he will soon go home happy, forgetting the headlines in the newspapers of the already distant past.

The Price of Coal

STAMPEDING as a form of exercise is not confined to coal buyers. Rumors of prices so low as to cause one to wonder are as rampant now as were rumors of the high prices last summer. Neither Senator Calder nor the Department of Justice can claim credit for the turn the market has taken. Patience is a virtue not possessed by all sellers of coal. A rush to cover now for next year's business at any figure is far from justified by a study of the basic conditions surrounding next year's outlook.

This is particularly true in the export market, where some may jump before they look. This is a new line of business for many who are now following it, and it is perhaps true that some are apt to judge the world's market, in which they hope to continue, by conditions in the United States. The price of coal in the export market is not determined by the cost of production in our Appalachian coal fields but by other factors, among which looms large the lower limit to which the British producer can go and the demand in Europe and South America. Things abroad are in too deplorable a condition industrially to warrant any conclusion at this time as to any but the very present value of the export market or what the price should be in 1921-22.

At home the seller of coal is better able and more experienced in judging the demand and what his share in supplying that demand may be. It is admittedly good business to tie up tonnage at a price that will suffer a reduction as the season progresses, but it is not advisable to expose one's self to the temptation of dodging contracts later on because those contracts were entered into in a pessimistic mood.

The Census Returns for 1919.

BECAUSE the Census must always live ten years behind the times and must needs make the statistics this year comparable to those of ten years ago we must be content with much less than we have a right to expect from this governmental effort. The preliminary statement of the Census of the anthracite industry for 1919, published this week, is given in full in the news column of this issue. The chief value of the data in this statement lies in the comparison it affords between 1909 and 1919 in certain items of expenses incurred in the production of anthracite.

The Census gives us no complete and inclusive picture of the anthracite industry, but the statistics are nevertheless interesting in several respects. In answer to the inquiry as to the amount of capital, both owned and borrowed, invested in the business of producing anthracite the aggregate answer of all the operators shows but $6.40 per ton of commercial production, compared with which we have the statement of the engineers of the Fuel Administration that the average for the industry is around $8 per ton of production.

According to the Census the invested capital in 1919 was $432,292,000 and the commercial shipments, as reported by the Geological Survey from the same returns, were 67,817,000 gross tons from which we deduce the figure of $6.40 per ton as representing the investment. On the basis of the same tonnage we find that salaries averaged 19c. per ton; wages and contract work, grouped as labor, averaged $3.13 per ton; supplies 88c. per ton, fuel for operation of the mine and purchased power together averaged 21c., rent and royalty 17c. per ton, and taxes, including income and excess profit taxes, averaged 21c. per ton.

The total of these items, all that are given by the Census, are equivalent to $4.79 per gross ton of commercial output, which is to be compared with $4.49 per gross ton of commercial output as reported by the Federal Trade Commission for November and December, 1918, at which time the wage scale was the same as throughout the year 1919. Compared with a labor cost of $3.13, as reported by the Census, we find $3.10 reported by the Federal Trade Commission, and compared with 88c. per ton for supplies, as reported by the Census, we find 77c. reported by the Federal Trade Commission.

General expenses reported by the Federal Trade Commission include rents and royalty, and in addition a charge for depletion on the part of those operators who own coal-bearing lands in fee. The Census did not include depletion charges as an item of expense, nor did it call for cost of insurance and a number of other items, small in themselves, that are recognized by the Federal Trade Commission in mine costs. If from the items of expense reported by the Census is subtracted the 21c. for taxes, not included in the mine cost as recognized by the Federal Trade Commission, we have a figure for f.o.b. mine cost of $4.58 from the Census, compared with $4.49 as reported by the Federal Trade Commission.

The most that we can say for the Census figures is that they appear to be somewhere near right, but they are not inclusive and not conclusive. Nevertheless the Census figures are all we have for anthracite costs for the year 1919 and we must make the best of them, for it is going to be some time before we have more Government figures on this subject. It is fitting, too, that we should at this time commend the Census and Mr. Katz for the timeliness of this report. The Census is proverbially slow and the collection and tabulation of the returns from 250 operators in eleven months is a remarkable performance for this particular Government bureau.

A SUMMING UP OF THE so-called "cancellation evil" and its possible remedies are contained in a final bulletin on this subject issued Dec. 4 by the fabricated production department of the Chamber of Commerce of the United States.

An exhaustive study of the practice of cancellation of orders and repudiation of contracts in almost every division of business has been made by the fabricated production department, as a result of which study it groups opinions as to possible causes under three heads:

"First, that the practice is the result of war-time irregularities and will pass as we return to a normal basis.

"Second, that we are now reaping the results of the loose business practices inaugurated before the war, when many lines were in a state of overproduction and the measures taken to unload this surplus were demoralizing. Those entertaining this belief feel that the remedy is in a general reformation of our system of order taking, making each order a contract enforceable by law.

"Third, that we have been drifting away from the fundamentals of sound business and the 'Golden Rule,' and that we must return to a stronger belief in the rights of others and a higher regard for our own integrity if the change is to be permanent."

First Ship-by-Truck Tipple To Be Constructed

By Donald J. Baker
Pittsburgh, Pa.

At Tylerdale, Pa., Coal Is Mined from the Properties of Various Industrial Concerns, to Which It Is Delivered by Truck or Belt Conveyor—Some Coal Will of Course Be Sold to Domestic Consumers and Provision Has Been Made for Coaling Locomotives and Making Shipments by Rail

FROM its organization chart to its operating units the Washington Gas Coal Co., of Tylerdale, Pa., presents innovations of much practical value. These departures from current practice come at an opportune time. In the main all the changes are in response to a problem with which many operators are for the first time deeply engrossed, viz.: How should a tipple for a fair-sized operation be constructed so that the entire mine output may be shipped by autotruck, which, by making the mine independent of the railroads, will guarantee steady operation the year round?

The tipple to be described is more than merely another new mining structure added to the many already in the Pittsburgh district, for it is the herald of a new era in coal mining. With the adoption of the practice of shipping coal in large quantities direct from the mine to the consumer's cellar a coal-mine plant becomes in a sense a public utility, as it controls the maintenance of service. This completeness is something that it has heretofore lacked, because mines have been dependent in the past on the carrying power of the railroads. All contracts hitherto have been made conditional on the regularity of railroad service. A plant having auto-truck delivery is, by reason of its facilities for shipping, highly efficient, as the question of car supply does not enter into its daily operation.

Large industries or consumers cannot depend for their fuel supply upon a finicky and unsettled spot market. The United States Steel Corporation, for example, as a guarantee of an adequate daily fuel supply at a reasonable figure owns, leases and has developed many thousands of acres of coal land, thus assuring itself that its mills will be in steady and unrestricted operation the year round. The Ford Motor Co. has recently purchased a large mine in Kentucky, and in this respect is pointing the way to other manufacturers of gasoline vehicles throughout the country.

Small manufacturing plants, or those incapable of supporting their own mines, usually are forced to obtain their fuel as best they may, often purchasing their daily requirements in the spot market. During the last year the condition of this market has not been conducive to a lowering of commodity prices throughout the country, as the prices secured for coal during the past twelve months have been excessively high.

Mine Operated for Benefit of Two Cities

Tylerdale and Washington, two small cities of Washington County, contain within their borough limits many small manufactories. Although this section of the country lies well within the bituminous field, these plants, chief among which is the Tylerdale Tube Co., consuming 200 tons of coal per day, have had to jockey and scramble for their daily fuel supply ever since their formation. The Washington Gas Coal Co. was organized solely for the purpose of supplying these manufacturing plants and the domestic consumers of Washington and Tylerdale, and the mine is so located that it is possible to deliver coal to them by truck far cheaper than it could be done by common carrier.

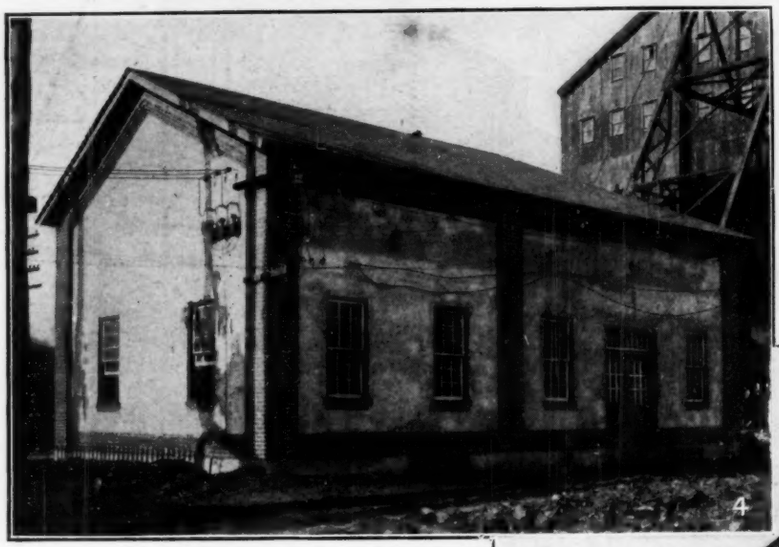
The Pittsburgh bed of coal, averaging 5½ ft. in thickness, underlies both Tylerdale and Washington. A large acreage of this bed is owned in the aggregate by the small plants desiring the fuel, but they have been unable to finance and operate mines of their own. For this reason, when the construction of a coal plant to supply these industries with fuel from a mine opened for their special benefit was broached, conditions were already favorable for such co-operative effort. The suggestion was obvious: Why not mine the coal from the properties of the consumers who own it, and allow each of them to become a stockholder in the mining company? This is exactly what is being done by the Washington Gas Coal Co.

Other small blocks of stock are, of course, held by private interests in the towns mentioned. These stockholders, as well as outsiders, will create a further market for the domestic product of the mine. The chief factor influencing the selection of the plant site in the town of Tylerdale was the fact that motor trucks could profitably deliver the coal from the mine to the market. Another consideration was that the miners might live in a town already built; thus the expense of constructing a "camp" was obviated. With the trucks guaranteed an easy hauling distance it might never become necessary to pay the increased freight rates demanded by the railroads for transportation of the mine product.

Notable Changes in Standard Tipple Design

A mine with a daily ship-by-truck output of 2,000 tons forms an important development in bituminous-coal practice. It will not, however, retain for long the distinction of exceptionality. As far as is known, nothing similar to this plant has ever been constructed heretofore, and it was natural that the tipple should exhibit some marked deviations from customary design.

Baton & Elliott, of Pittsburgh, mining engineers, designed and supervised the construction of the tipple and other surface buildings at this operation, working in conjunction with Jacobsen & Schrader, who furnished the equipment. The combined headframe and tipple was erected by John Eichleay & Sons Co., of Pittsburgh. The exterior appearance of this building differs quite radically from that of any other in this district.



Hoist House

All plant buildings except the tipple are built of stuccoed tile with brick pilasters. This forms a neat and attractive type of mine building.

Hospital and Foreman's Office

The grounds around all the surface buildings are to be sodded and when this has been done the plant will look almost like a factory.

In the first place, no railroad tracks pass beneath the structure, this space being needed for storage bins. Anthracite men looking at the illustrations accompanying this article will possibly aver that the structure more nearly resembles a breaker in outward appearance than any other tipple to be seen in the bituminous field.

Suited for Delivery to Four-Way Market

The tipple is constructed and equipped in such a manner as to make it possible to dispose of the product in a variety of ways. First, the entire output may be shipped by truck; this, however, will seldom be done. Second, some of the mine product will be used by locomotives of the Pennsylvania R.R., and arrangements have been made whereby they may be readily coaled. Third, the plant of the Tylerdale Tube Co. being located adjacent to the tipple, a conveyor shed has been erected spanning the intervening railroad tracks, so that coal may be fed by belt conveyor to the storage bins within the plant of this consumer; from that point it will later be removed by trucks to the various mills requiring this coal. Lastly, when the tipple has been entirely completed a railroad track will run parallel to and

Delivery Truck

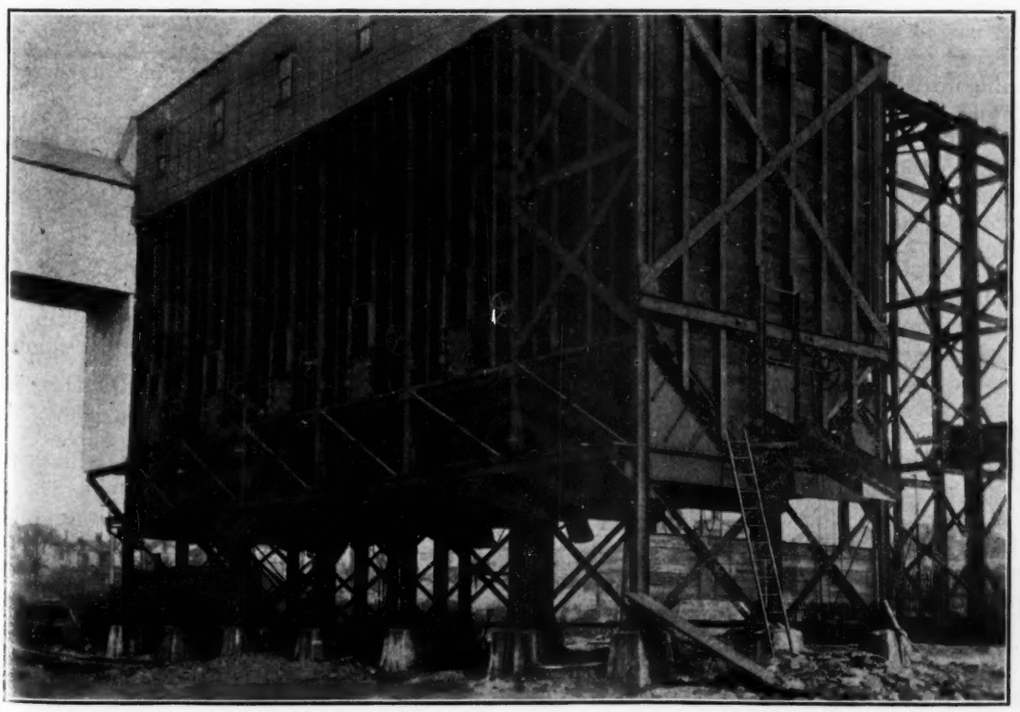
Each truck load of coal is weighed upon scales near the tipple. The trucks are numbered, and their movements may thus be easily recorded. They are equipped with a body elevator that assures the rapid discharge of their burden.

upon either side of the storage bins, so that it will be possible to ship by rail, if necessity so demands. This will occur only when the domestic trade of the two cities is not sufficient to consume the surplus left over from the manufacturing plants.

Thus a four-way market has been created for the coal from this plant, and only a serious breakdown of one of the main operating units can keep the mine from working daily throughout the entire year. Few plants in this country are today so well equipped as to attain continuous operation. Some plants in the Pittsburgh district situated on one of the river fronts are secure for perhaps a full nine months out of the twelve, but are not so fortunate during the remaining three months.

Except for the bins, which are of wood and lined with ¼-in. steel plate, the tipple is not greatly different from others in the Pittsburgh district. The main building is of structural-steel framework with the customary siding of corrugated sheet iron. Self-dumping cages are utilized to hoist the 2-ton mine cars to the dumping platform in the headframe. The cars discharge their contents onto a dump plate, from which the coal moves by gravity into a weigh pan.

After weighing the coal passes again by gravity to a feeder plate, which delivers it to a double-deck horizontal shaker screen. Both sections of this screen are operated by the same shaft, the flywheel of which is connected to a 50-hp. motor suspended from the roof trusses of the building. The eccentrics on this shaft which actuate the screen are so set that the screen sections oscillate in opposite directions, the upper screen



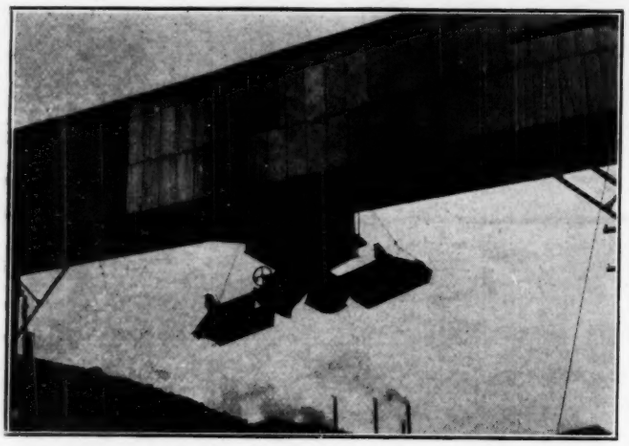
Storage Bins

Eventually tracks will be laid on the ground level along either side of the storage bins, so that cars may be loaded by chutes from the gates on the bin sides. Trucks drive under the bin, receive their load and drive out on the other side, thus making backing out unnecessary. The bin to the right is now employed for rock and slate.

having a forward, while the lower receives a rearward movement.

Each screen is 60 ft. long, perhaps 45 ft. of the distance being actually utilized as a container or conveyor of the coal. Thirty feet of this 45 ft. may be used as a picking table. When this operation is performed, extraneous material removed from the coal on the upper deck is dropped by the pickers into a narrow compartment upon the lower screen, which carries it to the rock-and-refuse bin at the forward end of the building.

As the coal leaves the feeder plate it passes over a



SUSPENDED CHUTE TO SUPPLY LOCOMOTIVE FUEL

By means of these double extension chutes either north- or south-bound locomotives may be coaled without delay. This railroad fuel will be taken from the conveyor which leads to the plant of the Tylerdale Tube Co.

screen where slack up to ¾ in. diameter is removed. Lumps exceeding this size are retained on the upper-screen platform and move forward until the 1¼-in. perforated plate is reached. Here the next size is removed, which then falls to the lower deck of the screen, by which it is carried to the rear until it reaches an opening in this deck and is directed to a chute feeding one of the storage bins, four of which lie directly beneath the screens. More concerning them will be said later.

The lump size that has passed over the perforations in the upper deck is conveyed to the end of the screen to drop through an opening to the lower deck, whence it passes almost immediately through a second opening to a chute feeding the lump bin. When it is desired to load run-of-mine, a plate forming a section of the feeder conveyor is removed, and the coal is permitted to drop by gravity into one of the bins.

Rock Loaded Into Trucks for Making Fills

Arrangements for handling the rock and refuse do not differ greatly from those employed at other tipples. Until another shaft now being sunk has been completed, all extraneous material loaded into cars within the mine will be brought up the main hoisting shaft. They will be discharged into a chute by by-passing the rock through a hand-operated reversible gate forming a section of the discharge plate at the head of the tipple.

The rock is thus shot by gravity through a steep chute into one of the storage bins. This arrangement, however, is only temporary. Eventually it will be necessary to fill all four bins with coal, so as to facilitate the steady operation of the trucks. But for the present the rock passes into the bin and is loaded from it into trucks and used as filling material around the plant buildings, which have been built on rolling ground which needs much grading.

Perhaps the most interesting detail in the plant centers in the bins, for it is these that make the tipple so notably different from others in the bituminous district. The bin at the forward end of the structure—that is, the one facing the hoist house—is utilized for holding the rock and refuse and has a capacity of 125 tons. The one adjacent to it holds screenings and slack and has a similar capacity. When other means have been provided for disposing of the rock, this bin will be utilized exclusively for run-of-mine.

Lump Bin Has Two Discharge Doors

Adjacent to the slack bin is the nut compartment. The bin holding the lump is located at the rear end of the tipple and has a capacity of 250 tons. From the external appearance of the bins it might be thought that they are five in number, but in reality there are only four. The lump bin, being twice the size of the others, is equipped with two discharge doors in the bottom, so that two trucks may be loaded at one time.

All four bins at present are equipped with ordinary loading chutes whereby they receive the coal as it comes from the screens. This, of course, is a temporary arrangement, for as soon as full operation is attained, some other method will have to be employed for lowering the lump sizes into their respective compartments. The distance from the screens to the bottom of the bins is nearly 20 ft. If the coal were to be allowed to fall such a height undue breakage would result. It is believed that the installation of a spiral chute to the bin bottoms will do much to eliminate this difficulty.

Rolling Down the Cone Will Cause Breakage

This probably is not the best arrangement that could be made, but it will perhaps suffice until the problem of building the most efficient ship-by-truck tipple has been solved. If a bin is nearly full, the incoming coal is subject to but little breakage. This, of course, is a condition that will seldom prevail. A spiral chute, while eliminating direct descent of the coal to the bottom, will not prevent all breakage, as the coal will pile up, cone-shape, at the bottom of the chute, and the incoming lumps will strike the top of the pile and roll thence to the bottom. This will, to a certain extent, defeat the purpose of the chute. It is difficult to predict just how in the future the breakage of coal thus dumped into bins will be eliminated.

As may be noted in the illustrations, a covered trestle spans the near-by railroad tracks. This leads directly into the yards of the Tylerdale Tube Co., where a storage bin is located. When this concern desires fuel the upper deck of the horizontal screens in the tipple will be veiled with a steel plate, as will also the lump-discharge aperture of the lower deck.

Belt Is Operated in Two Sections

The screens, with their oscillating motion, will then deliver the coal as a run-of-mine product to a 30-in. rubber belt. This is operated in two sections, the first, that nearest the tipple, being 65 ft. long, while the connecting length, or that adjacent to the Tylerdale Tube works, will be 40 ft. in length. This belt was installed in two lengths so that the coal might be discharged near the mid-section of the conveyor into a 10-ton weigh hopper for delivery, after weighing.

through an extension chute into locomotive tenders on the tracks of the Pennsylvania R.R.

Besides being equipped with a bottom gate for the removal of the coal into a truck beneath, each bin is supplied with two bottom chutes, one upon either side. It is planned to lay a single track parallel with each side of the bins so that coal may be delivered into railroad cars for shipment. When these tracks have been constructed, it will be safe to say that the tipple of the Washington Gas Coal Co. will be the best equipped of any to run every working day in the year.

Maximum Haul at Present Three Miles

For delivering its output locally this concern has already purchased two 5-ton Pierce Arrow trucks, each of which is equipped with a power-driven hoist for raising the beds in dumping. More of these machines will be ordered as the mine becomes more fully developed. The maximum haul over which these trucks will operate will not exceed three miles, the greater portion of which will lie over improved city streets, not obstructed by heavy traffic. Today the trucks are working day and night. No garage has yet been built for the housing of these machines, but a building undoubtedly will be constructed in the immediate future.

Units making up the remainder of the surface plant show the same careful consideration to detail that is evidenced in the tipple. Somewhat of an innovation is the construction of these plant units out of hollow tile having a stucco finish and ornamented by pilasters of brick. This makes an unusually attractive building and one that will adapt itself readily to the completed grounds. These latter are to be sodded and otherwise beautified. All the plant buildings are centered around the tipple and lie within a radius of 200 ft. from it.

Power for operation is purchased from the West Penn Power Co. A high-tension line carrying 22,000 volts is conducted to an outdoor transformer station situated in the immediate rear of the hoist house. Here three 150-kva. transformers, one of which is used as a spare, steps the current down to 2,200 volts.

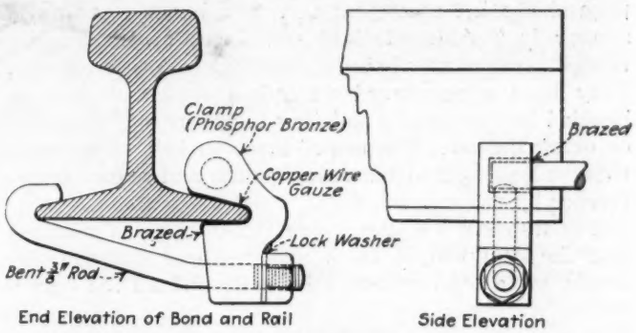
The hoist house is divided by a brick partition. This makes it possible to place the hoisting engine in one room and the generating equipment and all switches in another. A 200-kw. Ridgway motor-generator set delivers to the trolley wire the 500-volt direct current which is used in the mine. The hoist engine is of Lidgerwood make and winds a 1¼-in. cable on a 6-ft. cylindrical drum. This machine is direct connected to a 300-hp. motor.

At present both men and materials are handled through the main hoisting shaft, which is of the two-compartment type with a small additional compartment for carrying pipe, etc. The dimensions of the shaft are 22 x 10 ft. and it has been sunk 270 ft. to the coal. It is concreted from the surface to the bedrock, the remainder of the walls being wood lined.

Upon completion of the second shaft, now under construction, the burden of moving men and materials will be lifted from the main opening. This second shaft will be utilized also as an air intake. Just what disposal of rock will be made when this opening is completed has not yet been determined, but a large quantity of this material may be advantageously used for filling. It is quite possible that a truck will be assigned to the removal of this material from the immediate vicinity of the plant, as the management desires to keep the surface as neat as conditions permit. This is a commendable desire and one that many operators must consider to a greater extent than they have in the past. As this operation is situated in the heart of the town of Tylerdale, its officials could not well countenance a plant made unattractive in appearance by unsighty piles of rock.

Double Rail Bond Is Readily Detached And Easily Installed

A MODIFIED and improved rail-bond has been used successfully by a large West Virginia coal-mining company during the last eight years. The clamp is of phosphor-bronze and is gripped to the rail flange by a ⅜-in. hook bolt as shown. A strip of copper-wire



CLAMP ATTACHED TO LOWER FLANGE OF RAIL

It can be removed in five minutes and does not jar loose despite vibration of the track. Tightening of the nut assures satisfactory contact.

gauze between rail and clamp insures good contact, the clamps being linked together with 4-0 stranded copper cable. They may be furnished either thus joined and ready to install or they may be delivered singly to such customers as desire to use their own scrap cable for bonding purposes.

One of these clamps can be secured in place or removed by an ordinary workman in four minutes, whereas some bonds require half an hour or more for installation or removal. Once attached to the rail it cannot jar loose by vibration. Another advantage is that the clamp will last indefinitely; being made of phosphor-bronze it can be used over and over again. This makes it of special advantage for temporary track and for use in entries where ordinarily bonds are never used. Another detail worthy of attention is the advantageous position of the connecting cable, this being close to the rail web and thus comparatively free from injury in case of wreck or derailment. The bond is made by the National Electric Co., of Charleston, W. Va.

Two Traveling Laboratory Cars, the Hamilton and the Wyman, belonging to the Public Health Service and used in epidemic work, were transferred to the U. S. Bureau of Mines Nov. 30, having completed their work for the Public Health Service. One of these cars, the Hamilton, is to be rushed to Terre Haute, Ind., to take the place of the mine-rescue car of the Bureau of Mines formerly stationed there and which was destroyed by fire while in the repair shops of the New York Central R.R. at Cleveland, Ohio, last July. The other car, the Wyman, has been transferred to the Bureau of Mines to serve as a laboratory car in the field work of the bureau in the sampling and the classification of coals. The coal-sampling crew will live on the car, which also will contain the machinery and laboratory equipment for the crushing and preparation of coal samples.

How Coal Is Handled in South Africa

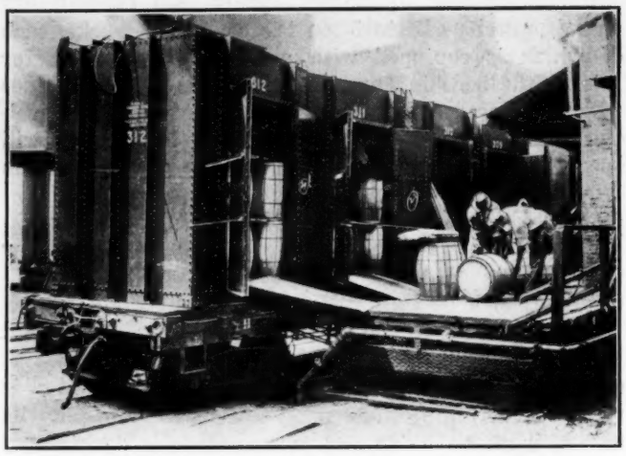
Coal Is Loaded Into Ten-Ton Buckets Which Are Lifted by a Crane Onto a Specially Fitted Car—At the Receiving Station the Bucket Can Be Removed by a Crane

AT THE Durban coal station in South Africa coal is placed in large box-like containers, each holding ten to twelve tons. These are lifted onto a special flat car designed to carry five of these portable bins. On arriving at the destination the consignee can remove these bins onto a motor car, transfering it without delay. The equipment was made by the Canadian Car & Foundry Co. The illustration on the succeeding page shows the assembled car. The buckets are quite similar to the loose-freight containers of the Trinity Freight system now being introduced into this country. They have a reinforced steel-plate shell and may be handled by means of a hoisting tackle or may be rolled on or off the car. The use of these buckets saves much time at loading and unloading points and makes transference by motor truck easy.

One wonders whether, when run-of-mine is required and the coal bed is thick and headway consequently ample, mine flat cars could be built to take the bucket to the working face, the novel cars being so handled that once the coal is loaded by the miner there would be but one handling of the coal from working face to the consumer's stock pile or boiler room.

Objections can readily be seen. The limitations as to size of coal delivered are among these. Consumers nowadays are coming around to the point where only sized coal is desired. Furthermore, the miner would find the bin not easy to fill, as the sizes would be excessively high. Then also the coal would be badly broken in the filling of the bin, though it would be saved all the degradation consequent on the handling at the tipple horns, beneath the tipple, at the railroad receiving point when the car is unloaded and when the coal is being reloaded into the motor car. There are also the objections that a greater investment must be made where bins are used and that a greater weight must be hauled on the mine car, railroad car and motor truck.

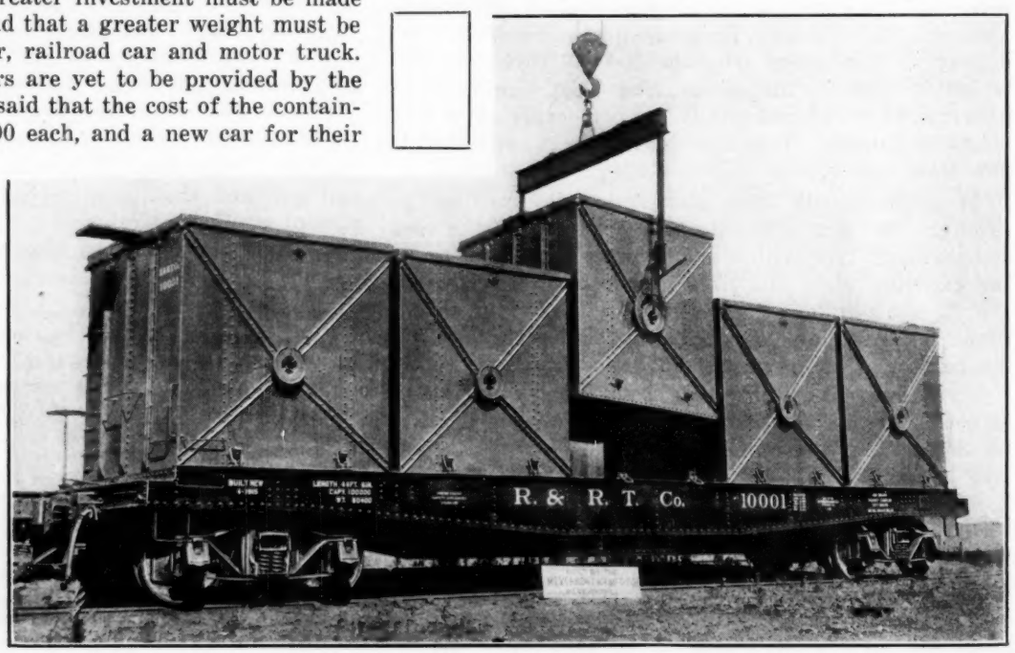
Furthermore, the cars are yet to be provided by the railroads, though it is said that the cost of the containers is roughly only $200 each, and a new car for their reception costs no more than the average freight cars. An old flat car can be rendered suitable by the expenditure of about $250. Apparently this change would make flat cars as well as open-tops available for coal transport and thus add to the flexibility of railroad equipment.



LOADING PACKAGE FREIGHT AT SMALL STATION

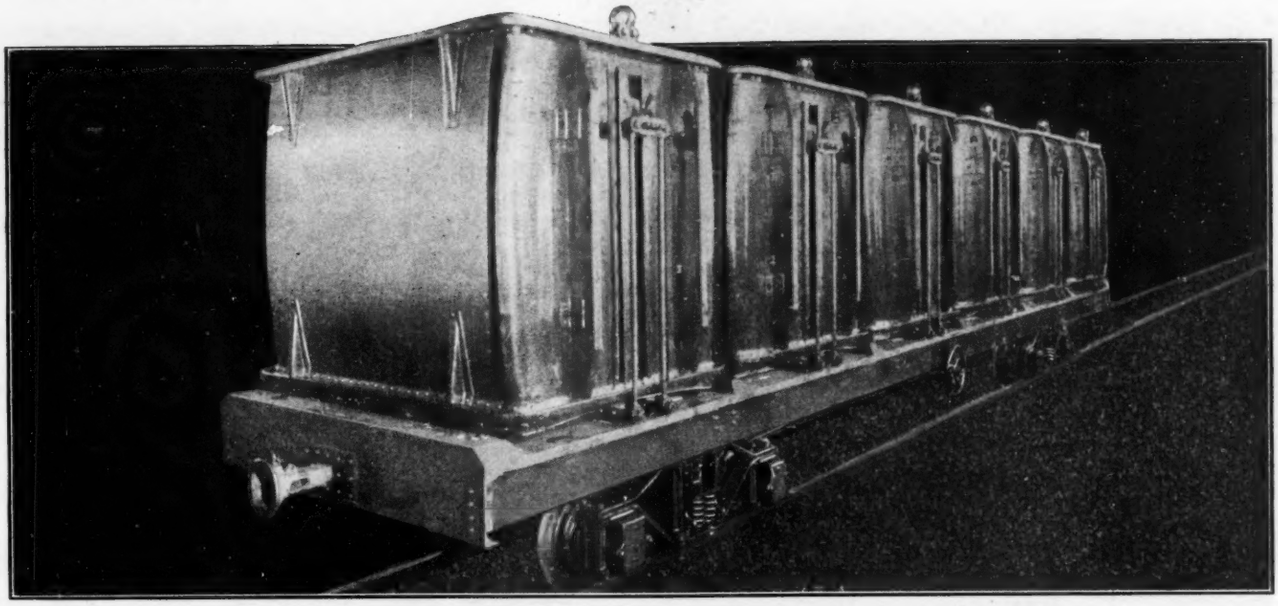
In larger stations the containers would be "yanked" off the car and placed where they could be unloaded at leisure, loaded containers being lifted onto the flat car in their place. Here no handling equipment is available, and the use of the track and car is needed during the loading and unloading of the containers.

Perhaps it may be permissible to refer here to what is being proposed for package freight, not because these proposals have much direct bearing on coal transport but because they illustrate how the scheme is thought worthy of trial for the transference of higher-class materials. The River & Rail Transportation Co., of



Coal-Bucket Car

Each container or bucket will hold ten tons of coal and any of them can readily be lifted by a crane, stationary or portable. It is readily locked on the car by the hasps along the edge of the car bed.



RAILROAD CAR WITH COAL CONTAINERS FOR SOUTH AFRICAN SERVICE

Each car holds five detachable coal containers having a capacity per unit of ten to twelve tons. There is nothing radically new in this container idea. It has been usual in the shipment of many lines of merchandise, the container in these cases being carboy, box or barrel. The new idea is to make the container larger, attach it to the truck and eliminate the practice of having every container stowed within another, namely, within the box of the box-car.

St. Louis, Mo., is building cars having five 10-ton freight containers or twenty 2½-ton units or several units of both capacities. These are of steel plate rigidly reinforced with angle irons which will withstand stresses imposed by the weight of the contents and the transference of the unit from one vehicle to another. Here, however, is an advantage not found in the coal container. The closed package container is weatherproof and foolproof.

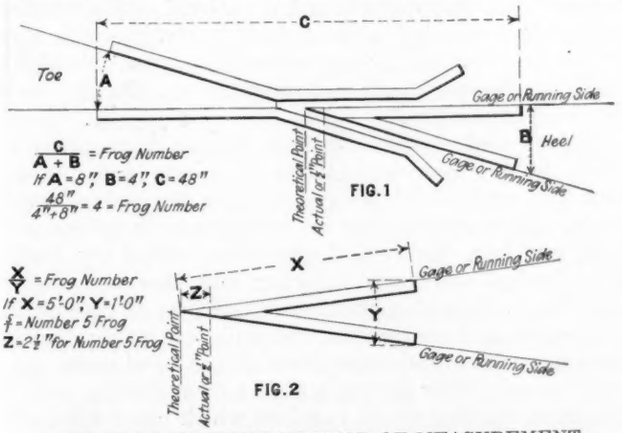
It is easy to see that the coal may be readily dumped when the bucket is in suspension. The idea is a novel one, but experience alone will prove whether it has possibilities for the coal trade. If it has, it will doubtless be suitable only where conditions are greatly favoring. Where package freight is being so handled and the factory does not have direct railroad facilities, this scheme may have much to commend it for supplying the factory with coal. It might fit in well with the distribution of powdered coal. Whether practical or not, it is worthy of consideration as an interesting way of handling coal, especially in less than carload lots.

The facts on which these remarks are based were furnished by the courtesy of *Railway Age*, which also supplied the illustrations.

Simple Rules for Measuring Mine Frogs

BY C. H. HAMPSCH

THROUGH a lack of knowledge of the manner in which switch leads and frog numbers should be calculated mistakes are not infrequently made by mine superintendents and foremen in ordering and laying mine track material. Fig. 1 shows the common nomenclature used in measuring frogs and a simple method of measurement, which may be explained as follows:



MINE FROG SHOWING METHOD OF MEASUREMENT

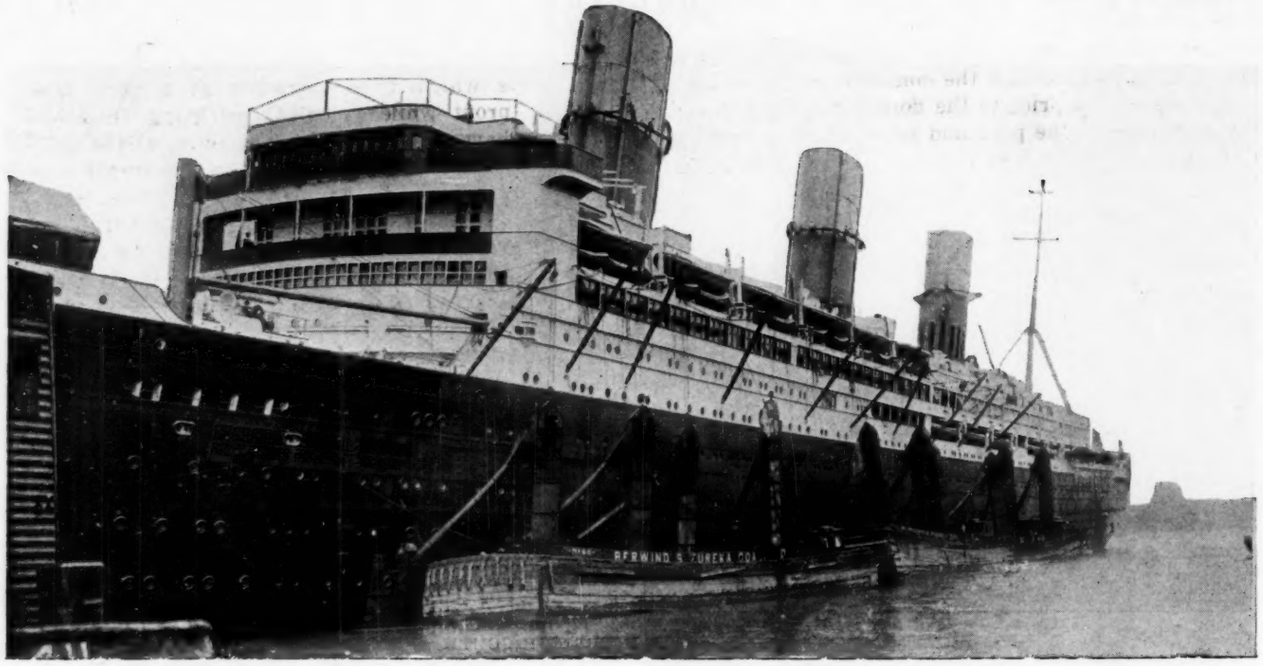
Be sure to measure to the gage or running side of the rail and do not use the actual point of frog but the point where the gage lines would meet.

Measure the spread or distance across the toe and heel of the frog and divide the sum of the two into the frog length. The quotient will be the frog number. For example, *A* being 4 in., *B*, 8 in. and *C*, 48 in., the frog number will be $48 \div (4 + 8) = 4$. Care should be taken that all measurements are made to the gage or running side of the rail. This is shown in Fig. 1 to be on the inside of the toe and outside of the heel.

Another method that may be used in measuring a frog is to find a place where the spread, or distance across the frog, on the gage line is, say, 1 ft., and measure from this point to the theoretical point of intersection of gage lines as shown in Fig. 2. The ratio of the spread to the length gives the number of the frog.

The actual or blunt point, commonly called the ½-in. point, is the place where the two rails are ½ in. wide. The distance of this point in inches from the theoretical point is one half the frog number. Thus in a No. 5 frog this distance is 2½ in., in a No. 4 frog, 2 in., etc. The theoretical point is the intersection of gage lines. It is not practical, of course, in construction to bring the rails to a feather-edge point.

It should be remembered in laying switch leads that the frog is not curved but is manufactured straight. Consequently only the lead rails are curved except in special cases, and occasionally switch points in short mine leads; also every frog has a lead the length of which corresponds to its number.



Why America's Export Coal Business Should Be Built Up

Effect of Exportation in Raising Coal Prices at Home Far From General—Would Mean Success for Mine Otherwise Unable to Operate—Opposition Inconsistent, Considering Our Wastefulness

By Erich W. Zimmermann, Ph.D.*

AMERICA, "the land of unlimited possibilities," has once more proved to the world that she deserves the epithet. Before the war we held many a championship in the industrial and commercial field, but during the war we added new trophies to our proud array. One of the most valuable of these is a crown of "Black Diamonds." The greatest producer of coal has become the greatest exporter of coal, a record held so long by England that we had almost believed it permanent. Before the war England was far in the lead in the international coal trade, with Germany a rather poor second. As far as off-shore exports were concerned we hardly figured at all.

All that is changed now. Germany had to drop out of the race altogether and England's loss was our gain. We were pulled and pushed to the fore. The world this year clamored for our coal and our unfilled indents at times exceeded our shipping capacity by millions of tons. So almost over night we find ourselves the premier coal exporter of the world.

New glories mean new responsibilities to shoulder, new problems to solve, new situations to face. As a nation we must learn to understand the vast possibilities which our leading position in the world's coal trade holds out to us. Perhaps in no other country is a popular understanding of commercial propositions as important as it is in the United States. For nowhere else is "the voice of the people the highest law" to the same extent that it is here. Popular support may make a business and popular disfavor unmake it.

Already we hear the first rumblings of opposition to the coal export trade. To quote from a recent number of the *Literary Digest:*

"Newspapers fear increased prices and profiteering; not a few call for an embargo. This is a situation requiring national action, says Mr. Hoover's *Washington Herald*, which insists that 'a prompt limitation should be put upon coal exports and a national coal controller should be appointed without delay.' Mr. Hearst's *New York American* says, 'keep our coal at home,' maintaining that the perils of coal shortage are already acute in American cities."

If our coal exports continue to gain momentum or even if only the present volume of exports is maintained for any considerable length of time the voices which today are clamoring for an embargo on exported coal will multiply, the cry of opposition will grow louder and louder, and clear thinking and thorough understanding will be at a premium. The jury of consumers, statesmen and economists who will pass on the merits and demerits of this new trade should hand down their verdict only after having struck a most careful balance between national profit and loss which come from coal exports.

As far as we are aware the opposition against coal exports bases its case on the following principal arguments:

(1) It is bad policy to export raw materials which

*Professor of commerce, the James Millikin University, Decatur, Ill.

could serve as the basis of industrial activity at home.

(2) Coal exports reduce the domestic supply of fuel, thereby raising the price to the domestic consumer and causing distress to the poor and needy and diminishing the competitive strength of our industries.

(3) By exporting coal we furnish our competitor with the weapon wherewith to strike our exporting manufacturer, thus enabling foreign countries to flood our markets with the cheap product of factories and sweatshops.

(4) Coal exports hasten the exhaustion of the most universally useful of our natural resources.

(5) Coal exports overburden much-needed railroad and harbor facilities, hampering our importers and exporters of general commodities.

We shall take up these charges in the order given.

In the days of the mercantile school of political economy it would have been a most daring enterprise to say a good word on behalf of coal exports. To export raw materials was bad—very bad. The great idea was to bring gold into the country, and that could be achieved only by pushing the exportation of manufactured goods and by allowing raw products to enter the land but not to leave it. The proverbial "favorable trade balance" thus obtained had to be offset by gold imports. Gold meant power, and power was the aim of all commercial policy. England waxed rich exporting coal and Germany before the war was most eagerly striving to emulate England's example. That proves at least that our ideas of economics have changed. We have learned to judge each branch of trade by its own merits or demerits. We have grown empiric instead of dogmatic. And apparently England and Germany think well of coal exports. Later on we shall say more of the reasons for their partiality.

Combats Penny-Wise-Pound-Foolish Policy

Now to the second point: Coal exports mean higher fuel cost at home. There can be no gainsaying that coal exports reduce the domestic coal supply and that decreasing supply in the face of stable or increasing demand forces prices up. We even grant that in case of prime necessities, a class of commodities among which coal is king, this elementary law of economics works overtime, meaning thereby that a slight reduction of the available supply is likely to produce an entirely disproportionate increase in price.

But while we do not deny this fundamental truth, we would point to several circumstances peculiar to our case of coal exports which considerably modify the general applicability of the law of supply and demand. In the first place there is a geographical factor to be considered. When we say "coal exports reduce the home supply" we give the impression that home supply is a uniform, homogeneous matter spread evenly over the whole continent of North America. But, as everyone knows, that is not the case. The sources of coal supply are bunched in fields which are relatively few and far between and the coal exported from one field does not by necessity affect the supply available to remote parts of the country. So by no means do all coal consumers have to pay more for their coal because several million tons of coal a year are allowed to leave the country.

Another modifying factor is that coal production is carried on under very diverse conditions of operating cost. Granting that coal exports raise the price of coal within certain fields situated within reach of tidewater, it does not follow that more coal would be available to the domestic consumer if exportation were discontinued. Those mines which were operating at a very close margin of profit while exports were going on would most likely have to discontinue operations, as the price reduction forced by an embargo on exports would wipe out their profit. In the case of a mine which works both for export and for the domestic market but whose location is such that its domestic market cannot expand beyond the figure it has reached—such a case is thinkable—to cut this mine off from its foreign market would almost certainly result in an increase in the cost of operation and possibly also in the price to the consumer, as the overhead would burden a smaller number of output units.

These modifications interfere with the unobstructed working of the law of supply and demand. Otherwise it could hardly be explained how Great Britain could afford to export one-third and more of her entire coal production and yet compete successfully as a manufacturing country. A third of our output would mean 150 to 200 million tons of coal, and all we are exporting by sea now is from 20 to 30 million tons, a miserly 4 to 6 per cent. So, as yet, it hardly seems worth while to get excited on that score.

Helping Our Debtors to Go to Work

But, says our learned adversary, exporting coal means to arm our enemy, to put into the hands of our competitor the weapon which he will use against us. Who are these dangerous rivals whom we must fear so much? Oh, the industrial nations of Europe! Great Britain, our greatest rival, does not ask of our coal. But France, Italy and Scandinavia clamor for the crumbs that fall from our table. Shall we push them away? Without coal the wheels of industry stand still and the home is cold. Those "over there" need our coal to get to work and to keep warm. And here, as elsewhere, generosity pays. Europe is our greatest debtor. In order to be able to make the goods which as exports will pay the interest and principal due us Europe demands our coal. We should be glad to see our debtor willing to go to work and help him in his laudable effort, not hamper him. Therefore do not stop our coal for Europe! About the rest we shall say a word later.

Now to the great argument that coal exports hasten the exhaustion of our coal mines. Undoubtedly they do. But geologists assure us that we possess more than half the known coal resources of the world. If we are to be afraid of shipping a few million tons of coal a year what are we to think of England, whose mines hold but a fraction of our resources and whose statesmen and captains of industry and shipping magnates are worried not because of the large volume of their coal exports but because of their inability to export much more than they do? Our own Commissioner of Navigation refers to those who try to throttle the British coal export trade as "the greatest suicide club on record."

Granted that our descendants who will inhabit this land in the year 3000 will blame us for having shipped out of the country a certain amount of coal, has the present no rights as against the future? Do we not wage wars with the wealth that future generations are expected to produce? At any rate, I for one belong to that class of cheery optimists who think that long before our coal is exhausted human ingenuity will have discovered some other source of motive power. Of course we cannot be sure that in the age of this new

motive power we shall enjoy the same advantages, possess the same preponderance as we do in this coal age. But we are optimist enough to think that mother nature, so kind to us now, will not in the days to come turn into a heartless stepmother.

At any rate what right have we to say a single word against coal exports as an accelerator of coal exhaustion as long as the waste of coal within our land is as appalling as it is? A great expert tells us that out of every thousand tons mined only 200 are utilized in creating energy. If we do export 10 per cent of our production can we object as long as we waste 80 per cent at home? As long as there is in operation in this country a single beehive coke oven, which wastes the valuable byproducts, we have to acquiesce in the exportation of coal, unless we wish to expose ourselves to a well-founded charge of inconsistency. We may go even further and say that as long as our waterfalls remain unharnessed, as long as our forests are cut down without proper regard to reforestation, as long as apples rot on the ground because of lack of proper co-ordination of the marketing mechanism, we cannot make an exception with coal exports and stop them on the ground of waste of national resources.

Why Not Embargo Iron and Steel Also?

Moreover, as far as the ultimate exhaustion of our coal mines is concerned, it makes no difference whether we export a ton of coal or a quantity of pig iron, steel or machinery the making of which required a ton of coal, or whether we send away any merchandise in sufficient quantities to require for their production, storing, transportation, etc., a ton of coal. In each case some foreign country gets one ton of our coal!

But that does not necessarily imply foreign consumption of our coal. For a part of our exports of coal, in the raw state as well as in the form of finished products, is not consumed by foreigners but by our own nationals, directly or indirectly. A few examples will illustrate and clarify what we wish to say. A clear-cut case would be that of a Mexican smelter owned by American citizens and operated with coal imported from the United States. Another case in point would be that of an American steamer which bunkers American coal in a coaling station abroad. Less transparent is the case of a foreign railroad the stock of which is partly or wholly owned by American citizens and which consumes coal exported from this country. The examples could be multiplied. But our case seems sufficiently proved.

There remains point five. We repeat the charge: Coal exports overburden our railroad and port facilities. It seems to us that this charge is easily answered. The bulk of our coal exports move through the Chesapeake Bay ports and the congestion is notorious in ports and along railroads leading to ports which do relatively little if any coal exporting. There is in most countries a wholesome division of labor among ports which in a natural way group themselves into grain ports, coal ports, general ports, import ports, export ports, etc. Therefore coal exports are not likely to interfere with other traffic as much as a general statement of the situation might lead one to assume. We do not for a moment deny that there is a good deal of congestion on the main arteries of our traffic and in our ports, but coal exports can hardly be held responsible.

In this article we have contented ourselves with the refutation of various charges which are raised or apt to be raised against the exportation of coal. In the next article we have set for ourselves a more cheerful task. We shall demonstrate by the example of Great Britain that a well-established coal export trade properly controlled and directed may become one of the most valuable of national assets a country may possess.

Failure of Dorrance Colliery Headframe

THE headframe of the Dorrance Colliery of the Lehigh Valley Coal Co. at Wilkes-Barre failed on Nov. 18, 1920. This headframe served for a six-compartment shaft and was the only one at the operation. Its failure means the closing down of the colliery for a few days until repairs can be made.

One of the legs of the frame completely collapsed and is about ten feet out of line. This leg probably will have to be completely rebuilt. The headframe is an old one and for some time the company has been preparing plans and making surveys for its rebuilding.

The accident happened during the afternoon while the men were at work, and all the employees underground were notified to prepare to leave the mine. They were assembled at the shaft stations and instructions were given them as to the method to be followed in leaving the mine. No open lamps were allowed, as the men had to pass through old workings and over falls and caves and come out by an old opening a long distance from the main shaft.

There was no confusion and all the men got to the surface safely but at a somewhat late hour.

U. S. Troops Intervene Nine Times in Coal Strikes in a Year

THE army was called out on nine occasions during the last year to preserve order in coal strikes, according to the annual report of the Secretary of War, Nov. 29. The Secretary lists the occasions on which troops were called out for duty in coal fields, as follows:

Charleston, Beckley and Clothier, W. Va.: From Camp Taylor, Ky., 55 officers and 793 men arrived Oct. 31, 1919, at the request of the Governor of the state, returning to camp Nov. 18.

Troops were sent to various points in Wyoming from Forts D. A. Russell and George Wright during November and December, 1919.

Troops were sent to various points in Utah from Fort Douglas, Utah, and Camp Kearny, Cal., during November and December, 1919.

In November, 1919, 5 officers and 127 men from Fort Niagara, N. Y., were sent to Brownsville, Pa., during a coal strike to guard the locks on the Monongahela River.

Cavalry troops were sent Nov. 3, 1919, to Gallup, N. M.; some left Dec. 4, 1919, and the others remained until Jan. 2, 1920.

Cavalry and infantry troops were sent to Raton, N. M., Nov. 3, 1919, and returned Dec. 20.

Troops were sent from Camp Lewis, Wash., to Bayne, Wash., Nov. 20, 1919, remaining eight days.

Troops to the number of 38 officers and 660 men were sent from Camp Funston and Fort Leavenworth, Kan., at the request of the Governor of the state, to Pittsburg, Kan., Nov. 30, 1919, and were withdrawn Dec. 17.

In December, 1919, cavalry troops were sent to McAlester, Okla., arriving Dec. 7 and departing Dec. 30, 1919.

Under the Microscope Coal Has Already Lost Much of Its Former Mystery—I*

Early Writers Believed Coal To Be an Inorganic Substance, Later That Coal Was Plant Matter Filling in Shrinkage Cavities—Contest Between Drift and Peat-to-Coal Theories—Belief That Coal Represents Only a Small Part of the Plant Matter Deposited

By Reinhardt Thiessen†
Pittsburgh, Pa.

ALMOST from the beginning of written history coal appears to have been known and described, and records indicate that it was used by the ancients. Aristotle and Nicander wrote about it, and Theophrastus in 371 B. C.[1] described it at some length and said that blacksmiths made use of it. It was then believed it to be an inorganic substance and that its origin was similar to that of rocks and stones in general. The fact that its weight, hardness and other characteristics are similar to those of stones was mainly responsible for this belief.

Later Claudius Galen (A. D. 130-200) advanced the hypothesis that coal was composed of earthy matters such as clay, and other clayey rocks impregnated with pitch or bitumen. Lakes of pitch and springs of asphalt and petroleum occurred in the vicinity of the Dead Sea and, having been reported at an earlier date, must have been known to Galen. That scientist, it should be noted, advanced the dual theory as well as the impregnation theory of coal, both of which were to influence men's ideas of the nature of coal even to the present day.

In England coal was discovered and used as far back as the ninth century and is said to have been brought into common use during the reign of Charles I (1625-1649). The English adhered for some time to the idea that coal was of inorganic origin. This theory was supported by Georgius Agricola (1544), by Francesco Stolluti (1637) and later by R. Kirvan (1799), all of whom were noted scientists of their day.

In most coals there is so much evidence of plant structure, even when observed with the naked eye, that plants soon become associated with the origin of coal. Valerius Cordus (1544) and Balthasar Klein (1592) appear to be the first to connect the one with the other. Later the opinion of the chemists became prevalent that coal was chiefly composed of carbon, or charcoal, and bitumen. The bitumen was generally held to be of inorganic origin, while the carbon, or charcoal, on account of its evident resemblance to wood, was held to be derived from plants. Others held that woody substances somehow buried in the earth or deposited in the sea had become impregnated with mineral bitumen.

*Article entitled "Recent Developments in the Microscopic Study of Coal," read at the meeting of the Coal Mining Institute of America, Dec. 9, held at Pittsburgh, Pa.

†Research chemist, U. S. Bureau of Mines.

[1]Theophrastus having been born about 372 B. C. and dying about 287 B. C., the date of the publication must have been somewhat later than that given.—Editor.

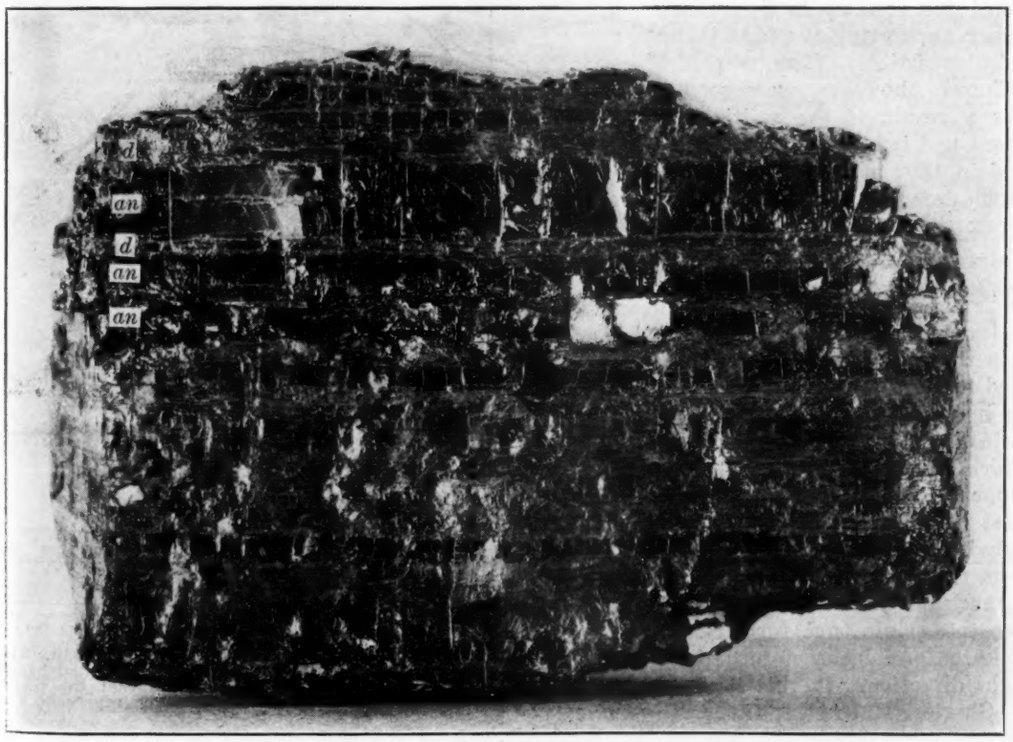


FIG. 1

Illinois Coal

The dark bands (*an*) represent the bright coal or larger anthraxylon components; the grayish striated layers (*d*) between the anthraxylon bands represent the dull coal. The white lines vertically to the banding represent thin plates of quartz filling narrow vertical crevices in the coal. Some of these plates are seen exposed on their broad side. Four-fifths natural size.

There was at that time no knowledge of the earth's history, no recognition of the time relationships of the different rock strata, and until this was known the position of coal far below other rocks was hard to explain. Such ideas as advanced by Buffon (1744) offered a plausible solution and are, therefore, not surprising. He believed that during solidification of the earth's crust caverns and bubbles remained, and that the surface was left uneven and full of hollows. Vegetation then appeared in great luxuriance, which after death and decay covered the earth with a slimy mass, which was later carried into the caverns and hollows, where we now find it as coal.

Scheuchzer, a Swiss, in a book on natural history written in 1718, advanced the first plausible explanation that coal was formed from deposits of woody matter. These woody deposits were thought to have been left by the Noachian flood. For many years after, this catastrophe was held as the cause of the accumulation of plant matter, which in turn gave rise to coal beds, and this belief persisted despite explanations to the contrary, even though the opponents of the theory based their argument upon careful observations and what have since been found to be correct interpretations. At that time it probably was dangerous, however, to argue against anything involving the Flood. About this time coal was being discovered and first mined in the eastern part of the United States—in the Richmond Basin (1760), at Pittsburgh (1763), Wyoming and Lackawanna (1768), and Pottsville (1790).

Beroldingen Advances Peat-to-Coal Theory

Beroldingen (1778 and 1792) was the first to advance a definite and plausible explanation of the origin of coal, namely, that coal had a like origin to modern peat. Beroldingen, therefore, is the man who first advanced the peat-to-coal theory. His ideas at once found firm adherents and a lively controversy was set up by those who believed in the drift theory advanced by Scheuchzer. The controversy between those who favored the peat theory and those who advocated the idea that coal was accumulated by drift continues even up to the present time, although the evidence supporting the peat theory was, and still is, uncontrovertible. The works of Beroldingen and his followers, however, were soon to be forgotten, mainly as a result of the writings of Johann Voigt, a prominent and influential author. His history of coal published in 1802 attacked Beroldingen in a slanderous way and defended the drift theory. It received an award from the Academy of Science at Göttingen.

Voigt Explains Loss of Plant Structure

Voigt found no plant imprints in coal. The cause of this he believed to lie in the fact that the plant mass, after having accumulated through drift, had undergone a fermentation process in which the vegetable matter lost its form and structure and was transformed into a gelatinous mass, which later hardened under the great weight of the superincumbent rocks. Through the fermentation process an oily substance had been formed which impregnated the remaining plant residue, thus forming bituminous coal.

Although Voigt did much to retard the advance of correct ideas regarding the origin and formation of coal he caused the public to form ideas of bituminization that led in the right direction. In this he found an eager follower in Charles Hatchet. Through a fortunate opportunity in having at hand a series of coals of all grades Hatchet was able to examine and compare coal in all its possible gradations of structure, texture and transformation, and to establish a positive proof of the plant origin of coal and also to show the relationship of the resinous and perhaps the oily and gummy substances of plants to the bituminous substances in coal.

Proves That Coals Are of Various Ages

In 1831, more than forty years after Beroldingen, McCulloch revived the peat theory and also gave the true relationships of coal beds to the earth's strata. He showed that the different coal beds were of different ages and that many of them must be of much greater age than was supposed. This, it should be noted, was an important step in advance.

With McCulloch, during the third decade of the nineteenth century, the controversy concerning the origin of coal lost much of its interest and may be considered to have closed. The occurrence of plant remains in all kinds of coal was considered by many such convincing evidence that coal originated in plant life that all further proof was deemed superfluous. Yet it must not be thought for a moment that arguments in favor of the inorganic origin of coal were concluded. Quite a number of men, and some of them quite prominent, within recent years have appeared in favor of the inorganic theory.

Toward the middle of the ninteenth century the trend of investigation and thought in coal was taking three directions. As has been already noted, there were from the earliest times two opposing theories of the

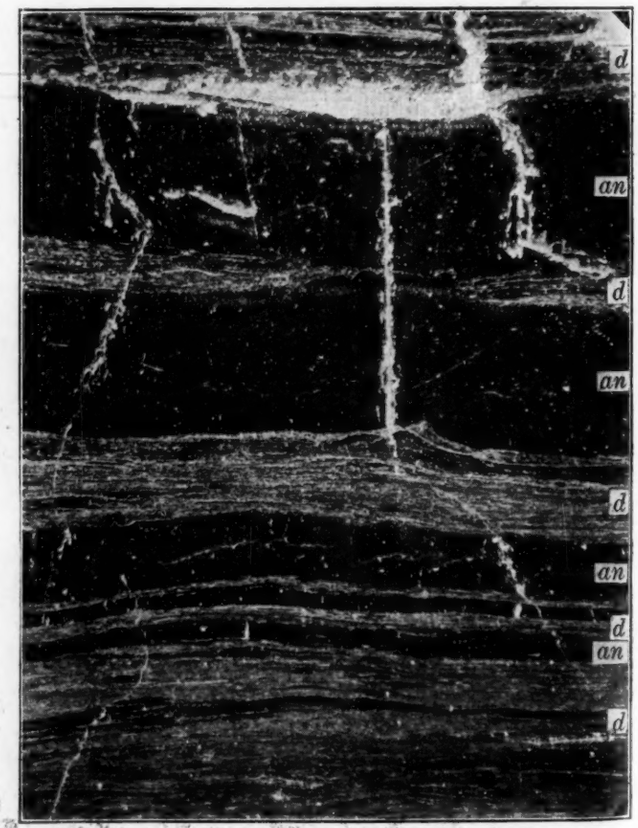


FIG. 2. PART OF A VERTICAL CLEAVAGE FACE OF COAL

Magnified 9.15 diameters, photographed by reflected light. The black bands (*an*) represent anthraxylon, the light striated bands (*d*) represent the dull coal. It will be noticed that the latter is compiled of black and light striæ; the former represent anthraxylon and the latter attritus.

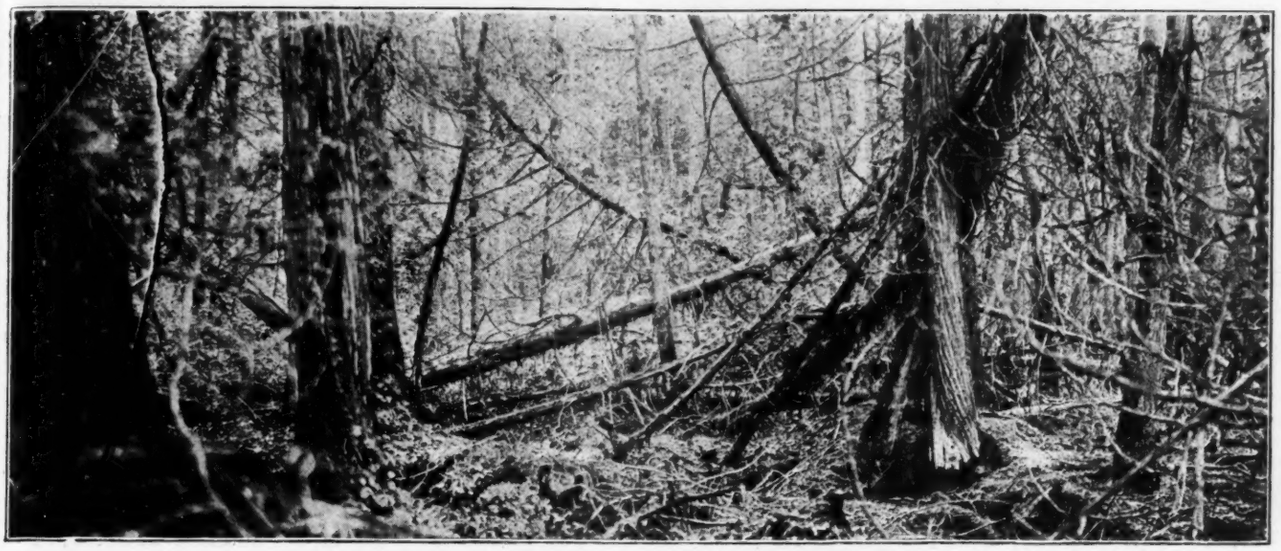


FIG. 3. ONE OF THE MANY PEAT BOGS IN WISCONSIN
Such bogs are found as deep as 30 ft. The most evident and the most characteristic substance met with in digging into the bed is a mud that at first is of a light color, but soon turns coal black. Where the mud is examined under the microscope it is found to consist of finely comminuted plant substances, or plant attritus.

origin of coal; namely, the peat theory, that is, that plants grew on the spot where the coal bed has been formed, and the drift theory, that the plants had been drifted or floated to the spot where the coal beds are now found. This controversy was continued mainly by the geologists.

The discussion of the origin of coal gradually merged into that of its composition. The investigation in this field, in turn, assumed two directions: One chiefly engaged the interest of the fossil botanists and sought to ascertain what kinds of plants entered into the formation of coal; the other interested itself in determining what kind and nature of plant products survived to form the coals, or, in other words: Of what is coal *now* composed? Those two phases were carried on by diversified classes of men—geologists, chemists, paleobotanists, and even preachers were engaged in this problem with, however, but insignificant results.

Colloidal Chemistry Till Now Not Available

With the theory of the origin of coal there also were associated the problem as to how the plant material was transformed into coal, and what were the agents that brought about this transformation. This problem mainly engaged the chemists and received a new impetus about this time by the works of De Sassure and Liebig but toward the end of the nineteenth century lost most of its interest for lack of an adequate advance in chemistry. This phase of the coal problem involves the chemistry of colloids, which, of course, until within the last few years was an unknown science, and thus no progress could be made in explaining the chemical changes that took place in coal. The lack of a study of colloidal action formed at that time an insurmountable barrier to further investigation into the maturing of coals.

Up to this time little had been contributed to the knowledge of the real nature of coal. That which was learned was merely incidental to the discussion of its origin. Little could have been done in this direction for want of proper means of observation. Only with the advent of the compound microscope, which at that time was crude and inefficient, was attention turned to microscopic research. The first real object in using the microscope, by the way, was not to elucidate the composition of coal but to prove its plant origin. This, however, immediately led to the study of its composition and structure, because in order to study the origin a better knowledge of its structure was required.

Witham the Pioneer in Coal Microscopy

The first to use the microscope in the examination of coal was Witham (1831). He had been accustomed to make sections of fossil wood, and to examine them with the microscope. He thus became familiar with the structure of wood, particularly that of coniferous wood. It should be remembered that little knowledge of the structure of plants had been obtained at this time.

It occurred to Witham to examine coals as he had fossil woods. In the Bovey coal, a brown coal or lignite, he observed unmistakably the structure of coniferous wood. In the cannel coals he observed peculiar cellular structures. It was these peculiarities that induced Hutton (1837) to continue the study. Hutton was not able to tell what these cells were, but found them in all the ordinary coals he investigated. He also found that in ordinary bituminous coals were two classes of material, the more homogeneous or more crystalline portion, and the duller portion. The peculiar cells were filled with wine-colored matter and occurred only in the duller portions. These bodies were observed by a number of later workers, but it was left to Balfour (1854) to identify them as the spores of certain lycopodaceous plants. Hooker, only a few years before this (1848), had examined and described a fossil cone in which the same kind of objects were found and identified as spores. The large ones, now known to be megaspores, he called seeds and spore cases. Some of these were later identified as megaspores by Dawson.

Spores Found Mostly in Dull Coal Matter

Huxley (1870) showed that spore matter was found in all coal, of which it always forms an important constituent; although it should be noted that Huxley much overestimated the proportion that the spores bore to the coal mass. Other investigators who observed spores in coal were Williamson, Wethered, Bennie and Kidston, and all agree with Hutton that the spores do

not occur in all the layers of the coal bed, but mostly in the duller portions. Wethered points out that the dull and bright laminæ occur alternately and that the dull laminæ contain most of the spore matter, though the bright coal contains little or none. Bennie and Kidston confirmed the relationship of these spores beyond any doubt.

Just at the time when the presence of spores and their origin was considered as settled Bertrand and Renauld (1900) came forward with new theories, which, by virtue of the prominence of these scientists, upset the whole conception of spores in coal and also the idea of the origin and formation of coals. They conceived that most of those bodies that had hitherto been called spores were algæ and with those developed the gelosic-algal[2] theory of the origin of coal. It became all the more serious when the theory was in part accepted by Potonie, the foremost investigator on coal at the time, who had many followers.

Jeffrey (1912) and Thiessen (1913) independently corrected this false notion of the algal and gelosic theories in proving that all the bodies called algæ were the spore exines of Paleozoic plants. But the gelosic-algal theory was fascinating and at once appealed to the geologists, as it also explained a number of phenomena that seemed as yet inexplicable. Hence it became popular and spread fast. It also got into the textbooks and much of it is there yet.

Hutton Thought He Saw Plant Structure

Hutton (1837) saw besides the "peculiar cells" "unmistakably more or less of the vegetable texture in the coal he examined." Link (1836), who examined similar coals soon after, did not believe that what Hutton saw was the structure of wood. Link probably was right; what Hutton saw were merely the cross-sections of thin sheets of woody matter in coal, usually mistaken for fibers. Link, according to his description, saw the structure of wood in coal as well as other plant tissues. It should be remembered that the plant structures observed in coal all through the years were not so much from thin sections of coal as from the microscopic appearance of the horizontal cleavages.

Goeppert (1846-1852) added more than all his contemporaries to the knowledge of coal, and apparently obtained all or most of that knowledge through the microscopic as well as the macroscopic appearance of the horizontal cleavages and by the ash method, for he never speaks of making thin sections of coal. We are indebted to Goeppert for the first extensive knowledge of the kind of plants that gave rise to coal, but he is somewhat in error as to what tissues of the plants remained to form it.

He inferred that charcoal or mother of coal was derived mainly from the Araucaria[3]; the bulk of the true coal to be formed from stems of Stigmaria, Sigillaria, Lepidodendra and Calamites,[4] but that the structure of these had been so much changed that nothing or very little of it was left, and that the discernible plant structure in the coal was derived from the bark of these trees. Ferns played but a small part in coal formation. Balfour (1854) asserted that Sigillaria and Stigmaria were the most important coal-forming plants and backed up his statements with good illustrations. Queckett (1853), on the other hand, believed that the Lepidodendra, Sigillaria and Stigmaria rarely, if ever, formed coal and that coal was formed almost entirely of coniferous trees—that is, trees related to our pines.

Huxley Thought Coal Mainly Bark and Spores

Dawson also spent much time in determining what kind of plant gave rise to coal, and adds Poacites and Ulodendra[5] to the list already given. The conifers, he concluded, are represented only by their bark. He found only very little woody or plant structure in the compact coal, the plant cells for the greater part having been obliterated and compressed into a homogeneous mass. Mineral charcoal consists of fragments of bark. Huxley concluded that none of the wood was left in coal and that the bark and the spores of plants contributed to the bulk of a coal bed.

Lesquereux, in order to determine the kind of plants entering into coal, probably made the most complete survey of fossil plants that has ever been made in America, as he believed it to be impossible to get a correct idea of the nature of coal if the nature of the plants contributing to the coal was not known.

With Dawson, Lesquereux and Guembel a new era in the idea of the nature of coal was inaugurated. They showed that all parts and products of all the plants, as far as known, contributed to coal; all possible plant structures and tissues, such as woody tissues and fibers, bark, parenchyma,[6] cuticles, spores, pollengrains, resinous bodies and other minor objects could be recognized; and that in coal all is bound together by a substance which Guembel termed "carbohumin" into a mass which appears more or less homogeneous. Relatively little plant structure had been preserved.

Our knowledge as to what kind of plants gave rise to coal beds has been supplemented by a number of investigators, the foremost of whom in this country is White. This subject has been worked up more from the rocks accompanying coal beds than from the coal itself and the literature regarding these fossilized plants has assumed vast proportions. It is of relatively little importance in the present consideration.

Noted Dull and Brilliant Layers in Coal

When Hutton was looking for spores in coal he also discovered that coal was composed of different kinds of layers and that the different layers could be classified into two kinds, the one a homogeneous "crystalline" body containing no spores or only a few, and the other a duller, less homogeneous layer which contained most of the spores found in the coal. Upon this basis he proposed to classify coals into slate coals, coking coals and cannel coals. The different layers and varieties of coals were ascribed to the original differences in the plants from which they were derived.

Dawson, thirty-five years later, came to similar conclusions, but he distinguished two main classes, mineral charcoal and compact coal. The compact coal consisted of bright concoidal pitch coal and duller slate coal with a horizontal fracture containing much earthy matter, arranged in thin interrupted laminæ. The bright coal, he concluded, was mainly derived from bark, and the

[2]Gelose—An amorphous gummy compound ($C_6H_{10}O_5$) in Chinese moss and seaweeds. Algæ—Green, brown or red aquatic cryptogamous plants occuring in both sea and fresh water, including kelps, seaweeds, diatoms, etc.—Editor.

[3]Araucaria—Pine trees.

[4]Stigmaria, Sigillaria, Lepidodendra—Plants having regular leaf scars which form a scale-like pattern. Calamites—Plants with jointed rod-like stems resembling the modern horsetail.—Editor.

[5]Poacites—Grasses. Ulodendra—Fossil trees with lepidodendroid cortical scars but bearing rows of large round or oval concave disklike scars, often several inches in longitudinal diameter, left after the fall of large deciduous cones.—Editor.

[6]Parenchyma—Cellular tissue.—Editor.

dull, coarse coal consisted of numerous sublaminæ of disintegrated vegetable matter mixed with mud. The mineral charcoal was supposed to be derived from the woody matter impregnated with bitumen.

Huxley also distinguished two classes: Mineral charcoal and coal proper. The charcoal was thought to be composed of stems and leaves reduced mostly to carbon. The compact coal he believed to be mainly composed of spore matter and some bark. The woody parts of trees, he concluded, had largely decomposed and disappeared.

Wethered Thinks Bright Coal Structureless

Wethered (1885) calls the "bright coal" a "hydrocarbon," and describes it as a structureless, dark brown mass forming an important constituent of coal, but he does not attempt to account for its origin. The dull coal contained a large number of microspores and megaspores.

Muck (1888) discusses the layering of coals at some length and introduces a new term, "pseudo-cannel coals," which he applied to the dull coal associated with the fatty coals and differing in respect to its origin from the dull coals which are associated with gas coals. The difference between cannel coals and pseudo-cannel coals is that the latter contain no algæ-like bodies. To determine the difference in origin in these coals he regarded as a difficult matter and not to be settled easily.

Potonie divides coals into three classes: Humus coals, derived for the most part from land plants; cannel coals, derived mainly from aquatic plants, and spore coals, derived largely from the more resistant plant substances like spores, pollens and resins. The humus coals have assumed a homogeneous, pitch-like consistency and are of a lustrous appearance and so are called bright coals. The dull coals have assumed a granular consistency and a dull appearance and so are called dull or mat coals.

Almost all the ordinary bituminous coals are mixtures of humus and cannel coals, arranged in more or less alternate layers, and are called banded coals. As the typical humus coals were supposed to be formed under the conditions which today ordinarily accompany the growth of the land plants, and as the cannel coals were supposed to have been accumulated under very wet conditions, in order to account for the alternations of the two kinds of coal in the same bed, Potonie assumed that during the formation of the ordinary striped coals there was a sort of struggle going on between very wet and dry conditions, a sort of oscillation from one to the other in relatively short periods of time.

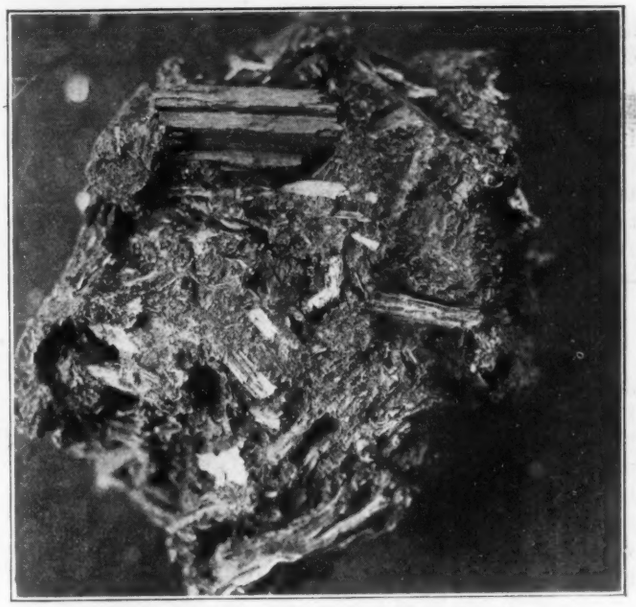


FIG. 4. DRIED PEAT FROM BOG IN FIG. 3

Substance is soft and soggy and can be readily cut by a spade. It is quite plastic and can be molded like clay. The cell or woody structure is definitely retained, but the cell walls have become thinner and softer.

Two Centuries of Scientific Surmise

These in brief are the peaks on the road that led up to the knowledge of the nature of coal possessed at the beginning of the twentieth century. Volumes

FIG. 5

Restored Peat Bog of Coal Era

Taken from a frontispiece in H. Potonie's "Enstehung der Steinkohle." On the right are the big brothers of our modern horsetails (Calamites, Arthodendra, Calamodendra and Protocalamites). On the left are Lepidodendra, Sigillaria, Ulodendra and the like.

have been written during the last two centuries. Yet, considering the number of investigators engaged on the problems involved, little progress had been made. If anyone should attempt to get an adequate understanding of the nature of coal through a study of the literature compiled on the subject during this time he would be ill-advised because of the numerous contradictions, the many conclusions drawn from wrong premises, the frequent wrong interpretations and the number of hasty conclusions.

Microscopy Is True Basis for Coal Study

Progress was slow because of the difficulty of the subject and wrong methods of attack; further, in many phases there was a lack of knowledge of the underlying principles. As is often the case today, investigators occasionally blindly followed a leader into realms that led nowhere. Writers of textbooks copied the conclusions of prominent men irrespective of whether they were right or wrong, and when a statement had once gotten into a textbook of authority it was hard to eradicate it. It is so even today, but the difficulty was greater in the years gone by. Scientists in other fields were content with what the textbooks had to say.

In recent years most of the investigations of coal have been made by botanists with a purely botanical point of view. Much credit for the resumption of this line of attack must be given to David White of the Geological Survey. White saw that in order to get a proper understanding of the nature of coal it must be attacked from the botanical side first and from the chemical side later; also that its study must begin with the peats and continue successively on through the lignites and the subbituminous coals to the bituminous coals.

Before actual microscopic examination of coal could begin difficulties in preparing it for examination had to be overcome. These in themselves constituted no small problem. Furthermore, before the nature of coal could be satisfactorily investigated all information relative to the subject in other allied branches of science, such as geology, botany, chemistry, colloid chemistry, physiography and fossil botany, had to be collected and brought into harmony.

The great hindrance to the investigation of coal has been in the difficulties encountered in preparing it for examination. From the time of Witham and Hutton to the present day the one great difficulty has been to make thin sections for microscopic observation. Many attempts have been made to overcome this and to devise means by which better results might be obtained.

Try to Determine Structure from Coal Ash

For a number of years a method was pursued that might be termed the "ash method." Small bits of coal were carefully burned, either partly or totally, and the ash skeleton remaining was examined under the microscope. Among such investigators were Reade, Phillip, Goeppert, Bailey, Teschemacher and Ehrenberg. Goeppert seems to have become quite efficient in this method, as much of his knowledge of coal was obtained in this way. The method, however, proved unsuccessful in general and led to no important results. Other methods were tried, but without success.

Frank Schulze devised a maceration method. He had been accustomed to purify cellulose by means of nitric acid and potassium chlorate. It occurred to him to test coals for residual cellulose by the same method, and so he discovered that coal could be macerated by first treating it with a mixture of nitric acid and potassium chlorate and then digesting it with ammonia. By watching the latter reaction under the microscope much of the structure in coal may be observed.

Guembel applied this same method with great success. It was mainly through this process that he gained his deep insight into the nature of coal and was able to give the first adequate contribution to the subject of coal structure. It is now common practice to use this method to supplement the microscopic examination of thin sections.

Quite recently Jeffrey of Harvard has tried to overcome the difficulties in cutting thin coal sections by first treating the coals alternately with a mixture of hydrofluoric and nitric acid and with alkalies, and then finally heating them in a hot ether and absolute alcohol solution. These treatments were supposed to soften the sample so as to make it possible to cut it with a sharp knife into thin serial sections. Nothing was gained in expediency by this method; besides, the original condition of the coal was entirely changed. Indeed, it was coal no longer.

Grinds Coal Sections to Transparency

Thiessen finally adapted to his needs the method that had been in use from the first, the same method that has been successfully used for many years by petrologists and fossil botanists. The plan as adapted in brief is this: The small rectangular piece of coal to be examined is polished on one surface. By means of a mixture of about one to two parts of marine glue and three to four parts of Canada balsam, heated to a proper consistency, the polished surface is cemented permanently to a glass object slide. The piece is then ground down roughly to a safe thickness on a wheel such as lapidaries ordinarily use and is finally ground down by hand on a very fine hone until thin enough to be transparent.[7] Oil shales are prepared in the same way.

From eight to twelve sections can be made in a day. The coal in such sections is entirely in its original condition. Sections can thus be cut from any desired part of the coal, either across the bedding planes or horizontally with them, and they may be studied and photographed at any magnification possible.

Every ordinary bituminous coal has a more or less pronounced alternate banding of bright and dull layers (Fig. 1). This phenomenon had long been noticed but was first obesrved in connection with microscopic work by Witham and Hutton, and later more definitely defined by Dawson and Wethered, who called the layers "bright coal" and "dull coal" respectively. Potonie, who called them glanz and mat coal, made them the object of considerable discussion and did much theoretical work in an effort to explain them.

Dull Coal Represents Attritus Material

It has now been definitely determined that the bright bands represent constituents that at one time were pieces or fragments of wood of varying sizes and that the "dull coal" represents layers of compiled constituents that at one time were smaller fragments of wood interlayered by macerated plant matter or débris derived from many kinds of plant products called the "attritus" (Figs. 1, 2, 3 and 4).

Many sections have been made of the bright bands

[7] A fuller description of the method is to be found in Bull. 117, "Structure in Paleozoic Bituminous Coals," U. S. Bureau of Mines.

and examined under the microscope, and in every case it has been shown that they were derived from fragments of wood, such as parts of stems, limbs, branches, twigs and roots. Woody structure has been preserved in all of them (Fig. 2). In some cases such constituents represent quite large pieces, but most of them represent only minute fragments.

Between these two extremes all sizes are present. These constituents are always flat; the semi-decayed wood, having been at one time soft and pliable, has been compressed and flattened. Being constituents derived from wood now turned into coal, they have been called "anthraxylon," meaning wood coal. The nature of the anthraxylon may best be elucidated through a study of peat. It is now generally admitted that coal was formed as peat is being formed today. The whole process can, therefore, be studied first hand by studying peat. Peat may be taken as the first step and lignite as the second step in the process of coal formation.

(To Be Continued)

Illinois Mining Institute Meets at Springfield for Annual Fall Conclave

Two Subjects, One on Accident Prevention, Another on Vocational Education, Bring Out Interesting Discussions—Frank F. Tirre, of the North Breese Coal & Mining Co., Succeeds William Hall as Society President—Next Summer Outing To Be Held on Boat from St. Louis

FEW meetings of the Illinois Mining Institute have roused greater interest than the one held in Springfield, Nov. 20. It was attended, however, by only about forty persons. The autumn program usually is shorter than that of the summer meeting, to which about half a week is devoted. The two papers which are presented have to be read and discussed on the same day on which the officers are elected and the necessary business is transacted. This leaves scant time for technical discussion.

The meeting, which was held in the Municipal Building, was called to order at 10:30 a.m. by William Hall, chief of the Illinois Miners' Examining Board. Charles T. Bauman, Mayor of Springfield, who had promised to welcome the delegates, was unavoidably absent, and Ernest Fullenwider, assistant State Attorney, spoke ably in his place. Fred Phaler, general superintendent of the Superior Coal Co. and a past president of the institute, responded.

William E. Kidd read a paper on "The Cause of Fatal and Serious Accidents in Mines," in which he emphasized the human elements in accident prevention rather than the technical or mechanical. Mr. Kidd referred to the progress from hand to electrical mining and declared that the wide use of electrical energy was an important factor in the increase of mine fatalities. Mr. Kidd represented that there were so many negative return conductors in a mine that if a man touched a conductor he was likely to make a direct connection with some such return conductor and be not merely shocked but electrocuted.

A decrease in the number of skilled men in the mine, Mr. Kidd said, accounted for the increase in the number of accidents. This lack of skill arose from the failure of the sons of mine workers to follow the occupation of their fathers. With a lack of co-operation between mine workers and management and a decline in discipline safety hardly could be expected.

Suicide or Official Negligence?

Joseph Haskins, state mine inspector of the Third District, condemned the resignation with which miners met accidents, ascribing them to a preordained fate. Nor did it seem much better for the officials of the mine to talk of suicide when a man was killed as a result of something that appeared a foolhardy stunt. It was, he said, a poor way of covering someone higher up who really was the man at fault. He said that for every life taken by a preventable accident some man living could be blamed. When flesh is scrapped under such circumstances it is either due to a failure of the underground executives to comply with the inspector's warnings or to a hazard which the manager might have detected had he noticed and appreciated it, or to lack of knowledge by the deceased of the dangers of his work.

Mr. Haskins proposed that a statewide campaign be started to show the miner how he might gain maximum production with minimum danger. He cited the fact that the United States Fuel Co. had taken over a mine in Vermilion County which had a statewide record for frequently recurring preventable accidents, and that the company as a result of its safety work had recently extracted three million of tons without a fatality.

Safety as a Vocational Study

W. L. Morgan, state inspector of the Eighth District, urged that the education provided by the State Vocational Educational Board should deal with safety even more than with matters of production. He said that Great Britain, despite the general friability of its mine roofs, the gaseous quality of a large proportion of its mines and the difficulties of ventilating adequately its old and extensive workings, had an enviable record for lowness of accident rate. Mr. Morgan attributed this fact to the better discipline of the miners of Great Britain.

Henry B. Thompson, state inspector of the Seventh District, said that between 90 and 95 per cent of present-day coal-mine accidents could be prevented. Out of the last eighteen fatal accidents recorded by the Department of Mines and Minerals, fifteen were, according to the report of the coroner, preventable. Mr. Thompson related the following story: A miner completed his day's work by drilling holes for a shot, knowing that the shotfirers would fire the hole during the night. The mine examiner in making his rounds the following morning detected considerable quantities of gas in the room and so reported to the manager, who immediately ordered the man to another section of the mine to work there till his place was made safe. So anxious had the manager been to keep the man from danger that he had his check retained till he could point out the hazards and explain the transfer. But all the care was of no avail. The man went back to his old place, apparently to see if the blasting had done its work. Having an open light he set fire to the gas, which, exploding, snuffed out his life.

Love of Dollar as Accident Cause

The miner is like a capitalist, and the lure of the "almighty dollar" misleads him like the rest of us. This man had a safe working place and he could well have waited to load the coal in his old room. Mr. Thompson believed that the man violated the rules in the belief that the mine manager was trying "to slip one over on him" in the interest of the company.

Following Mr. Thompson's remarks James Taylor, economic investigator of the state, moved that John H. Walker, president, Illinois State Federation, address the meeting. Mr. Walker laid the accident increase to unfamiliarity of the miners with the latest approved practices and to speed

of production. He added that coal mining was a seasonal industry and the men who leave the mines in the summer are not assigned, on their return, to the rooms which they left, and so their knowledge of the peculiarities of the place in which they have worked is not available to defend them from danger. As Mr. Walker did not believe that mine work would ever be made steady, he advised the mine management to urge the miners to seek work in nearby brick plants so that when the brick plants closed down, the old force of men would be available to work in the mines.

Mr. Walker urged that the laws of the state be enforced against examiners and managers who are guilty of criminal negligence. Though carelessness might be punished as manslaughter, the courts usually took cognizance of the offense only by taking away the certificate of the offender. He believed that a jail sentence should be given when the certificate was cancelled. It is a small hardship to take up a certificate, returning it, as is the custom, at some later date. Mr. Phaler stated that in his belief accidents were increasing because the majority of the managements of mines did not initiate any systematic campaign of accident prevention.

Value of Vocational Education

After lunch J. T. Kolb, head of the industrial division of the state board, made an address on the "Value of Vocational Education," describing the vocational board as composed of three departments: industrial, agricultural and home economics. In the latter department girls were educated in scientific cooking, buying, sewing, etc. Any man who had mastered a certain knowledge of the fundamentals of any trade was eligible to enter a part-time trade extension school, where he was given additional instruction and a definite amount of what might be called "shop work." This gave him a chance to obtain work, and while doing this he was able to spend his evenings at classes where further instruction in his life work was given him.

Work for miners' education had not, however, been so completely elaborated. There were classes for hoisting engineers, for examiners and mine managers. Up to the present eighteen vocational schools have been started for mining men. Teachers were chosen from among those who already held certificates. Some of the teachers were state mine inspectors.

Miners Suspicious of Schools

It was necessary to select men who would be congenial to the mine workers, for they were prone to view the opening of a school with suspicion. It was the common practice to write the town board of education and the local branch of the union, asking them to suggest a suitable instructor, and often the mine workers are themselves consulted before the classes start.

James Taylor led the discussion with a declaration that only college-trained men had been allowed to act as teachers. Mr. Taylor wanted men who had risen from the pick. Martin Bolt, the secretary, managed to get in a word, denying Mr. Taylor's statement, and several of the inspectors declared that they had acted at one time or another as instructors.

Mr. Bolt then read the report of the auditing committee, which found about $1,800 in the treasury. One of those present protested that this looked like too much money and wanted all the papers of the institute from its first session printed and bound, but at a rising vote the plan was voted down.

New Officers Are Appointed

The following were elected as officials for the ensuing year: President, Frank F. Tirre, secretary-treasurer, North Breese Coal & Mining Co.; first vice president, H. H. Stoeck; second vice president, John Millhouse, and secretary-treasurer, Martin Bolt. The executive committee that served last year is continued in office. It consists of Thomas P. Bach, Charles Kerrell, Harry Fishwick, James Taylor and Samuel Jenkins. The summer meeting of next year will be held on a steamboat leaving St. Louis for a three-day cruise.

At the banquet at the St. Nicholas Hotel references were made to the loss of John Thompson, formerly chief of the Department of Mines and Minerals, and of Walter Rutledge, of the Bureau of Mines. About seventy-five were present. On the call of President Tirre, who acted as toastmaster, addresses were made by William Hall, Fred Phaler, John Walker, Martin Bolt and James Taylor.

Anthracite Joint Scale Board Empowered to Change Agreement, Secretary Wilson Says

THE joint scale committee of the anthracite operators and miners conferred on Dec. 1 with Secretary of Labor Wilson on the interpretation of the President's letter suggesting adjustment of alleged inequalities in the wage award. After the conference Secretary of Labor Wilson issued the following statement:

"The operators and miners of the Joint Scale Committee of the anthracite coal field have had a misunderstanding concerning their authority under the communication of the President reconvening the scale committee. It is definitely understood that the agreement now in existence will continue in force and effect during the time for which it was entered into. The Secretary of Labor has interpreted the communication of the President to mean that the Government will not interfere with the Joint Scale Committee in making any changes or modifications which they may mutually agree should be made in the agreement."

No statement was issued by representatives of either the miners or operators.

Those attending the conference were: Representing the anthracite operators: S. D. Warriner, president Lehigh Coal & Navigation Co., Philadelphia; W. J. Richards, president, Philadelphia & Reading Coal & Iron Co., Pottsville; C. F. Huber, president, Lehigh & Wilkes-Barre Coal Co., Wilkes-Barre; Frank Hemmelright, vice president, Temple Coal Co., Scranton. Representing the mine workers: Philip Murray, International vice president, United Mine Workers of America, Pittsburgh; John Collins, president District 1, United Mine Workers of America, Scranton; Thos. Kennedy, president District 7, United Mine Workers of America, Hazleton; C. J. Golden, president District 9, United Mine Workers of America, Shamokin. James A. Gorman, secretary of the Anthracite Coal Commission, also attended.

Carnegie "Tech" Has Complete Coal Mining Laboratory

THE most elaborate coal-mining laboratory in America is just being completed for the Carnegie Institute of Technology, of Pittsburgh. The equipment comprises a full-sized coal mine, except that it yields no coal; a mine locomotive and a full set of coal- and metal-mine machinery that have been furnished by manufacturers. The laboratory is located beneath the building of the division of science and engineering of the institute.

In connection with the mining laboratories there will be a well-equipped ore-dressing and coal-washing plant.

It is proposed to extend the mine during the practice work of the students along such a plan that it can be utilized for carrying some of the steam and water pipes of the institute.

Huston Thompson, of Colorado, was appointed chairman of the Federal Trade Commission Dec. 1 for a term of one year. Mr. Thompson, who was vice-chairman during the last year, succeeds to the chairmanship under the rule of the commission which provides for rotation in the office of chairman among the several commissioners. Mr. Thompson was first appointed to the commission by President Wilson in December, 1918, to fill an unexpired term, and in December, 1919, was reappointed for a full term of seven years. He also has served as Assistant Attorney General of the United States, in charge of the Court of Claims branch of the Department of Justice.

Problems of Operating Men

Edited by James T. Beard

Mine Foreman Fails To Observe Standing Orders

The fatal mine explosion that occurred in No. 3 mine of the Union Collieries Co., at Renton, Pa., July 19, 1920, resulted from the mine foreman's failure to observe the standing orders of the company, forbidding any one to enter the mine after any interruption of the ventilation, until the mine had been examined and pronounced in a safe condition.

BEING one of the special commission appointed, by the chief of the Department of Mines of Pennsylvania, to investigate and report as to the probable cause of the explosion that occurred in the No. 3 mine of the Union Collieries Co., at Renton, July 19, 1920, I was naturally deeply interested in the letter of "Safety Inspector," *Coal Age*, Sept. 16, p. 593, entitled "Negligence or Ignorance, Which?" The letter discussed certain elements or conditions that the writer assumed were possible contributory causes of the disaster.

While I felt, in reading this letter, that the premises taken were in some respects incorrect and tended to do an injustice to the company who operated the mine, I refrained from writing on the subject at the time, preferring to wait until after the holding of the coroner's inquest, which would throw much light on the matter and, it was hoped, would establish the responsibility for this terrible calamity. I am inclined to think that if all the details of that occurrence had been known to the writer of the letter to which I referred, the knowledge would have changed his views and altered his conclusion.

In the first place, the established rule and practice at this colliery was to operate the mine in three shifts. The regular mine foreman and his several assistants entered and took charge of the mine, each day at 7 a.m., and quit on the arrival of the second shift at 3 p.m. Again, another foreman and his assistants were in charge from 3 p.m. until the third shift arrived at 11 p.m. This was the nightshift and they remained in the mine until the arrival of the dayshift at 7 a.m. the following morning.

Each day the mine was regularly examined by the firebosses, who entered and started their work at 3 a.m., four hours before the entrance of the dayshift. The officials in charge of each shift were thus given full opportunity to confer with the officials of the next shift regarding the conditions existing in the mine. These arangements would indicate that the management had made ample provision for the safety of their employees, in respect to the examination of the mine.

The statement made in the letter mentioned, which reads: "There was but a single fan installed when a more up-to-date equipment of a gaseous mine would suggest duplicate fans," is incorrect. To my personal knowledge there were two fans installed at this plant each operated by a separate motor, which leaves no question but that the mine was provided with ample means of ventilation; and there had been no trouble arising from this source prior to this explosion. The records made from time to time in the books kept by the mine foreman and firebosses fully demonstrate this fact.

VIEW OF FAN HOUSE AFTER THE EXPLOSION

Regarding the equipment of the mine and other arrangements, it can be stated that the electric current was carried down the mine shaft through insulated cables of 500,000 circ.mils. These cables were conducted immediately into a switch-house at the bottom of the shaft. Here cutout switches were installed to enable the shutting off of the current from each of the several haulage roads, and a similar switch controlled the current in each pair of butt or face entries. Electric wires were not extended beyond the last crosscut.

The mining machines in use in this mine were of the latest and most approved type. Brick stoppings and over-casts were kept in good condition, the stoppings being built as the entries were extended. Indeed, the air current was conducted about the mine in a way that met with the hearty approval of the district mine inspector. I can vouch for the fact that most of the officials of this mine were capable and reliable men.

At the appointed time, I made it my business to be at Renton and attended the coroner's inquest held there. I noticed that the management of the mine made no attempt to hide the fact that the fan had been stopped for 21 hr. The mine officials informed our committee that the company furnishing power to the mine had requested them to have the line cleared on Saturday noon, July 17, owing to the need of making important repairs at the power station. The officials stated that on receipt of this notice, arrangements were promptly made to suspend all operations at the mine by noon Saturday. From that time nothing was done till the night foreman reached the mine at 7 p.m., Sunday, July 18, ready to make his inspection of the mine four hours before the time for the regular nightshift to enter. Owing, however, to a combination of circumstances, power to operate the fan was not available until about 2 a.m., Monday.

The management did not attempt to justify the action of the night foreman, who is said to have entered the mine about an hour and twenty minutes before the explosion occurred and who took with him the pumpers and other men who were to work in the mine. According to the statement of the management, this was a direct violation of the instructions given some time previous and which were in the nature of "standing orders." These orders were to the effect that if the ventilation of the mine was interrupted for any time, long or short, no one other than those whose duty it was to examine the workings, was to be permitted to enter the mine until the examination had been made and reported.

In the consideration of safety, allowance must always be made for the human equation and the proneness of men to take chances. Safety must always depend to some extent on these personal elements. There is always the possibility that the individual will fail at the supreme moment when all depends on his judgment and action to avert disaster. It is my firm belief that had this foreman been less anxious to get the work started the accident would not have occurred.

JOHN G. BART, Supt.
Republic Iron & Steel Co.
Russellton, Pa.

Where Does Responsibility Rest?

The exercise of practical common sense by a fireboss, it is argued, would prevent him from permitting the use of open lights beyond a place generating gas and worked with locked safety lamps. For what is a fireboss employed except to safeguard the mine against such practices?

AFTER asserting that under no conditions would he permit open lights to be used on the return air coming from places generating gas and worked with safety lamps, Robert A. Marshall, asks: "Did the foreman violate the mining law?" and adds, "I am compelled to admit in justice to him, that he could not be held for any violation of the law as it reads."

The reference here is to a section of the Bituminous Mine Law of Pennsylvania (Art. 10, Sec. 3), which after prohibiting the use of open lights on the return air coming from any portion of a mine worked with locked safety lamps, adds: "The provisions of this section shall not apply to any mine wherein explosive gas is generated only at the face of active entries."

ONE MUST USE COMMON SENSE

If, as Mr. Marshall has stated, the fireboss cannot be held responsible on the ground of violating the law, is it not true that he is yet responsible for failing to use his common sense? It would seem that any schoolboy would know better than to work open lights beyond a point where explosive gas has been found.

My answer is: If a fireboss finds gas in dangerous quantity, requiring the use of safety lamps at any point in his section, he cannot be excused for permitting the use of open lights on the return air in that section. It would be his duty to fence off the entire section and notify the mine foreman, who in turn should notify the superintendent; and it may be required for that official to notify the inspector.

Any man who is in charge of a mine or section of a mine, whether fireboss, assistant foreman, or mine foreman, is responsible for its safe condition, and he must use practical common sense that would teach him that gas and open lights do not go together. The only logical conclusion in this case is that if safety lamps were used at the faces of the two headings where gas was generated it was wholly unsafe to permit an open light to be used beyond that point.

Speaking of the rapid diffusion of the gas into the air current, I am glad to note that Mr. Marshall, admitting this fact, still holds that no one can tell at what moment an increased flow of gas will render the current explosive. The striking of a large feeder of gas may be expected at any time when driving headings generating gas, and ample provision should be made to safeguard the mine against such a possibility.

Before any fireboss makes up his mind that it is safe to allow the use of an open light on the return of a section generating gas, or beyond a point where safety lamps are required, he should ask himself a few questions such as the following: 1. What percentage of gas would be safe traveling in the return air where open lights are in use? 2. What is the least percentage of gas that the ordinary fireboss will detect in an air current on an entry? 3. What assurance has he that this percentage will not be increased at any moment, where the conditions are such as to require the use of safety lamps inby on that current?

WHAT IS EXPECTED OF FIREBOSSES?

Speaking of responsibility for safe conditions, permit me to ask our mine foremen what they expect of their firebosses and assistant foremen. Do they not expect each of them to use practical common sense in the discharge of their duties? Mr. Marshall states: "From a practical standpoint, however, I want to say that he [fireboss] took long chances." That word "chances" has laid many a poor man in his grave; and the *chance* taken may not have been his own, but that of some fireboss whose foreman has not held him responsible and expected him to use his common sense.

Perhaps Mr. Marshall is right in his idea that the reading of the law allowed the use of open lights on air returning from a place where safety lamps were used but no one will claim that in so doing a fireboss displays practical mining judgment. It may not be too severe to impose even the death penalty where the *willful* failure of a fireboss to exercise his practical common sense and judgment has resulted in the loss of innocent lives.

JOHN H. WILEY.
Oliphant Furnace, Pa.

Safety Devices vs. Moral Hazards

The improvement of safety devices, designed to prevent the occurrence of accidents regardless of the unreliable human factor is here regarded of relatively less importance than the discussion of moral hazards and their consequences.

MY ATTENTION has been attracted to a single statement that occurred beneath the photo of C. F. Tolman, president of the National Safety Council, in *Coal Age*, Oct. 14, p. 803. Following is the statement: "Why discuss moral hazards, until the mechanical devices have done their utmost to render accidents impossible?"

The question of accidents, their causes and prevention, has been discussed and analyzed so frequently that it is difficult to say or write anything that has not been already stated at one time or another. It is therefore a relief to have someone bring to our attention the fact that other avenues than those commonly discussed are open to investigators engaged in finding out ways and means of preventing mine accidents. The statement just quoted refers to improved mechanical devices designed to increase mine safety.

EACH MINE WORKER A SAFETY DEVICE

In a sense, a human being is a safety device, but one that is prone to frequent failure, because of the frailty or weakness of the ordinary individual. Moral hazards depend on the individual, and are proportioned to his capabilities and faithfulness, to say nothing of his personal equation that is a large factor in the success with which he is able to avoid or prevent accidents from occurring.

Most of us will agree that more responsibility has been placed on the individual operator, in this regard, than we have been willing to place on improved safety devices. It is true that no engineer or mechanic can put together machinery that will perform with the same completeness and in a manner equal to the functions of the human body; but the mechanical device acts independently of the human mind and is supposedly capable of greater certainty owing to that fact.

The average reader may not have given a thought to the quickness with which sensations are transmitted from any part of the human body to the brain and *vice versa*. The moment a pain is felt through contact of any part of the body with a hot iron or otherwise, the sensation is instantly communicated to the brain and, in response, a second impluse is communicated back to the muscle, which promptly breaks the contact to avoid further injury and pain.

TRAIN MEN TO WORK SAFELY

To my mind, the problem of the greatest importance in relation to safety is the perfecting of this human device and eliminating, as far as we may, the possibility of its failure. The question is, What can we do to train men to operate with greater certainty and thereby improve the safety device they themselves each represent? Unless we can do this we shall fail to eliminate the moral hazards that must always be a controlling factor or one of at least equal importance to the best designed mechanical safety devices. In other words, we must teach the worker to safeguard himself.

Not to be misunderstood, let me say I am an advocate of good roads, good ventilation and other means of increasing safety in mines by employing

the best methods and systems of working. The fact remains, however, that the mine where men are taught they must take no chances is the mine that has the best record for safety. All that has ever been written and the best rules and regulations for securing safety must fail in their object, unless we can bring workmen to realize that they must protect themselves. This will doubtless be difficult to accomplish. While we can lead a horse to water, we cannot compel him to drink, and the same is true of the individual.

OUR MINE OFFICIALS SECOND TO NONE

In this country, we have mine officials who are second to none in the world in respect to their intelligence and practical judgment. Yet, there is a tendency among us to play the part of the "good fellow." In our efforts to gain greater safety in mining, let us study what has been done along this line in other countries where mine accidents are less frequent than in our own mines.

None of us desire to place greater hardships on miners and mine workers; and yet safety will often compel us to draw the line more closely than has been our wont. No excuse should be accepted or any leniency exercised toward a worker who has willfully taken a chance and risked injuring himself and others. No violation of mining laws or mine rules and regulations must be tolerated if we are to reduce our accident rate to a minimum.

Plains, Pa. RICHARD BOWEN.

Open Lights and Gas

The frequent recurrence of disasters, with which we are far too familiar, should lead us to discourage the practice of chancing the use of open lights on the return current coming from a section where gas is generated to such an extent as to compel the use of safety lamps.

NO DOUBT many, like myself, have been surprised at the contention of some contributors to this discussion, that the use of open lights on the return current of a section or portion of a mine worked with safety lamps, could be regarded as safe practice on any assumed conditions.

A short time ago this quesiton was discussed in *Coal Age*, in reference to a certain section of the Bituminous Mine Law of Pennsylvania that seemingly allowed the practice. Recently, attention has again been drawn to the same question, by the inquiry of J. M. Nichols, *Coal Age*, Sept. 23, p. 642. Mr. Nichols cites an instance of the use of open lights on the return of a section where fifteen men were employed and gas was generating at the faces of the first three rooms in that section.

My opinion is that the use of open lights, on the return of any place generating gas in quantities requiring the use of safety lamps, should not be permitted. It appears to me that such a practice is not in harmony with most of our state mining laws, or in keeping with our practical experience and knowledge.

In Indiana, the law requires that the workings of a mine shall be kept "free from standing gas of whatsoever kind to such an extent that the entire mine shall be in a fit state, at all times, for men to work therein." Although this may frequently be almost impracticable, yet the law should prevail.

It is possible that the three rooms mentioned by Mr. Nichols may have had a foot or more of gas at each face, and yet the fireboss was unable to detect any gas between the roomnecks and the last breakthroughs. Such a condition would lead some to say that the balance of the section could be safely worked with open lights. However, this is a straight question and admits of but one answer. The entire section should be marked "Keep Out," and no one should be permitted to enter, until the gas has been removed and the entire section examined and reported safe for work.

Some time ago I remember firebossing in a very gassy mine where the men had struck against the use of safety lamps and the mine was being worked with open lights. I firmly believe that as time rolled on they had cause to regret their action. It is not my wish to exonerate the management of the mine in granting the demands of the men, since the mine was equipped with electricity and even the fan and the hoisting engine were operated by that means, which should have called for the exercise of greater caution on the part of the management.

It happened that, owing to the loss of power, the men were withdrawn from the mine one Saturday afternoon and two men went into the mine with electric lamps for the purpose of bringing out the mules. An explosion followed that blew out most of the stoppings and all the doors on one side of the mine. Though the men escaped death, one of them was badly injured by being run down by a car blown by the blast of the explosion.

In an adjoining mine, I had another week-end's experience in an explosion that occurred at night when but seven men were down in the mine. There were in this mine many acres of old works that were full of gas. These had been sealed off and it was the practice to allow the gas to bleed off at night, by opening holes in the stoppings.

In some way, the gas was ignited and an explosion followed killing a motorman and severely burning the nightboss. Some forty stoppings and three overcasts were blown out and much other damage done in the mine. It may be that storage-battery locomotives would have avoided this explosion; but these incidents show some of the dangers in mining practice.

Linton, Ind. W. H. LUXTON.

Inquiries Of General Interest

Detecting Carbon Monoxide Gas

A percentage of carbon monoxide dangerous to life cannot be detected on the flame of a safety lamp.

PLEASE say if carbon monoxide gas can be detected in mines by observing its effect on the flame of a safety lamp. I have seen a statement that this gas causes a lengthening of the lamp flame. The question was argued at considerable length at a meeting I once attended when a large number of firebosses and mine foremen, were present, and there was such a diversity of opinion expressed that I decided to submit the question to *Coal Age* and ask if a percentage of gas that is dangerous to life would produce any visible effect on the flame of a lamp. At the meeting, a few firebosses stated that they had observed the lengthening of the flame when they were confident that no marsh gas was being generated and thought the effect was produced by a trace of carbon monoxide too small to affect the life or health of workers.

———, Ill. FIREBOSS.

Carbon monoxide is an extremely poisonous gas, one-tenth of 1 per cent often proving fatal when breathed a sufficient time. This percentage of gas however, is too small to produce any visible effect on a lamp flame.

When the flame of a lamp is observed to reach upward in a slim taper blaze, the probable cause is a deficiency of oxygen in the air, which causes the flame to lengthen in an effort to secure the necessary oxygen to complete the combustion of the carbon.

Carbon monoxide must be detected by observing its effect on caged birds or mice, as illustrated in the accompanying figure. These small animals are prostrated with the gas in far less time than a similar effect is produced on a healthy person.

Examination Questions Answered

Anthracite Foremen's Examination, Ninth District, May 4, 1920

(Selected Questions)

QUESTION—*What distance is required between main doors to comply with the Anthracite Mine Law? Tell how main doors shall be built and placed.*

ANSWER—Article 10 of the anthracite law treating on ventilation does not specify any distance apart of main doors. The law requires all doors to close automatically (Sec. 9). An attendant must be constantly on duty to open and close each door (Sec. 10). Main doors must be so placed that one door shall always be closed while the other is open in order to prevent the short-circuiting of the air (Sec. 11). An extra main door must be provided and kept standing open, ready to be closed at once in case the door in use is broken (Sec. 12). Each door must be hung in a solid frame fastened securely in stone, brick or mortar, unless otherwise permitted, in writing, by the inspector (Sec. 13).

QUESTION—*(a) What are the four electrical units? (b) What three things should be proportionate for the safe transmission of electrical energy?*

ANSWER—(a) The four common electrical units are the volt or unit of pressure; the ampere or unit of quantity; the watt or unit of power; and the ohm or unit of resistance.

(b) In the transmission of electrical energy the voltage and amperage of the current are proportioned to the resistance of the conductor or the line resistance in order to effect the greatest economy and safety.

QUESTION — *How would you proceed if you discovered a workman in contact with a charged electric trolley wire in a mine? Describe in detail, assuming that the workman is unconscious.*

ANSWER — If a switch is close at hand, shut off the current. Or, standing on a dry board or dry clothing or paper, cut the wire with one sharp blow of an ax, between the victim and the power house. In any event permit no delay, but drag or push the man off from the wire, standing on a dry board and using a dry garment or dry wooden rail for the purpose.

When the man is free from the wire proceed at once to apply artificial respiration, turning him over on his stomach, with face to one side to permit free breathing, and head resting on one arm. See that the mouth is clear and the tongue pulled forward so as not to obstruct the throat. Then, kneeling astraddle of the man's thigh and placing the outspread hands across the small of the back and the lower ribs, proceed to alternately compress and expand the lungs by the forward and backward motion of the body, at the rate of regular breathing, say sixteen times a minute. This must be continued until the person shows signs of life or until a physician, previously summoned, has arrived. Efforts to revive the person should not be discontinued for two hours or more or until the person is pronounced dead.

QUESTION—*What precautions would you take, as foreman of a mine, to prevent and reduce accidents from falls of roof?*

ANSWER—The means of avoiding accidents from falls of roof can be classified under four heads, as follows: 1. The adoption of a systematic method of timbering that is suited to the conditions in the mine. 2. Making and enforcing rules and regulations designed to increase safety in the mine. 3. Maintaining a thorough inspection of the mine by competent and trustworthy officials, at frequent regular intervals while the men are at work. 4. Maintaining discipline by suitably punishing all violations of the mining laws or the rules and regulations of the mine. Attention to these four requirements will go far toward preventing and reducing the number of accidents in the mine.

QUESTION — *(a) If a safety lamp shows a cap of 1¼ in. what percentage of gas is in the air current? (b) If you discovered this condition existing in your section in the morning, while making your round as an assistant foreman, describe in detail the action that you would take.*

ANSWER—The percentage of gas corresponding to a 1¼ in. cap is

$$\sqrt[3]{36 \times 1.25} = \sqrt[3]{45} = \text{say } 3\tfrac{1}{2} \text{ in.}$$

(b) Three-and-one-half per cent of gas present in the air would indicate a dangerous condition existing in that section of the mine. The duty of an assistant foreman, on discovering such a condition, would be to promptly withdraw the men working in that section, notifying them to extinguish all open lights at once. A fireboss should then be stationed at each entrance to the section to prevent any one from entering the same until the danger has been removed and the foreman notified.

Having withdrawn the men safely from that section, it may be possible to increase the circulation of air therein without interfering with the regular work in other portions of the mine. When that is not the case, however, all the men should be withdrawn from the mine and means taken to improve the gaseous condition in the affected section. The increase of gas may be only temporary owing to striking a fresh blower; but if permanent it will be necessary to arrange for an increased air volume in that section to dilute and sweep away the gas.

QUESTION—*As foreman in a very gaseous mine where electric cap lamps are used as a means of illumination, what precautions would you take to insure the safety of the workmen under your charge? What additional precautions would you take to prevent accidents from gas, other than complying with the requirements of the mining law?*

ANSWER—In a mine generating gas in considerable quantity and where the miners use electric cap lamps they should be supplied also with safety lamps. In such a mine safety inspectors should be employed in addition to the assistant foremen. All miners should be instructed to watch their safety lamps to detect any unusual gaseous condition of the mine air. The safety inspector should make frequent and careful examination of every portion of the mine to insure that the ventilation is adequate and the ventilating current properly conducted and made to sweep the working faces clear of gas. The miners' cap lamps should be properly protected with strong wire netting or otherwise safeguarded against the bulbs of the lamps being broken.

In addition to these precautions competent shotfirers should be employed to examine charge and fire all holes drilled by the miners, and this must be done after the men have left the mine. The shotfirers must examine each place before firing a shot therein and refuse to fire any shots that in their judgment are unsafe. Only permissible powders must be used, and all shots be fired by electric battery.

QUESTION—*(a) What is the nature of permissible explosives? (b) How do they differ from black blasting powder?*

ANSWER — (a) For the most part permissible explosives contain ammonium nitrate or other nitrated compounds, or salts having a high percentage of water of crystalization. The aim is to reduce the flame temperature and render the explosion of the powder as nearly flameless as possible, through the agency of the nitrated salts and water of crystalization. Permissible powders are exploded by percussion, and a far less weight of the explosive is required to produce the same effect in blasting.

(b) Permissible explosives differ from black powder in the fact that they produce less flame and this has a lower temperature than the flame produced by the explosion of black powder. While black powder is readily ignited by a spark or flame and its action is deflagrating, permissible explosives must be detonated by the use of a percussive cap, and a less weight of the explosive is required for the same work.

Movement of Coal by Fourteen Railroads, July and First Seven Months of 1920

(Compiled by U. S. Bureau of Foreign and Domestic Commerce)

SHIPMENTS DURING JULY

Classes and Railroads	Originating on Line		Received from Connections		Total	
	1919	1920	1919	1920	1919	1920
For Revenue Only	*Short Tons*	*Short Tons*	*Short Tons*	*Short Tons*	*Short Tons*	*Short Tons*
Bituminous						
Baltimore & Ohio	2,992,204	3,481,938	1,400,630	1,146,911	4,392,834	4,628,849
Buffalo, Rochester & Pittsb'gh	531,601	895,181	15,375	23,248	546,976	918,429
Buffalo & Susquehanna	120,808	174,779	.....	.....	120,808	174,779
Chesapeake & Ohio	2,453,693	2,215,323	209,235	249,314	2,662,928	2,464,637
Huntingdon & Broad Top Mtn.	88,183	24,088	521	49,801	88,704	73,889
N.Y. Central (Buffalo and east)	669,381	834,358	.....	.....	669,381	834,358
Norfolk & Western	1,979,980	1,912,662	219,872	306,425	2,199,852	2,219,087
Pittsburgh & Lake Erie	554,279	409,252	679,746	576,785	1,234,025	986,037
Pittsburg & Shawmut	169,930	263,300	.....	.....	169,930	263,300
Pittsburg, Shawmut & North'n	45,116	65,077	34,598	31,223	79,714	96,300
Virginian	410,105	633,752	55,459	68,317	465,564	702,069
Western Maryland	386,233	530,064	574,526	366,188	960,759	896,252
Totals	10,401,513	11,439,774	3,189,962	2,818,212	13,591,475	14,257,986
For Company Fuel						
Bituminous						
Baltimore & Ohio	479,782	426,961	26,801	4,912	506,583	431,873
Buffalo, Rochester & Pittsb'gh	54,020	70,111	.....	.....	54,020	70,111
Buffalo & Susquehanna	7,344	7,018	.....	.....	7,344	7,018
Chesapeake & Ohio	168,344	203,596	.....	.....	168,344	203,596
Huntingdon & Broad Top Mtn.	.....	1,744	1,463	.....	1,463	1,744
N.Y. Central (Buffalo and east)	131,745	77,511	.....	.....	131,745	77,511
Norfolk & Western	152,657	154,083	49,048	48,380	201,705	202,463
Pittsburgh & Lake Erie	21,447	18,655	19,612	25,043	41,059	43,698
Pittsburg & Shawmut	1,061	3,394	.....	.....	1,061	3,394
Pittsburg, Shawmut & North'n	3,101	5,264	.....	.....	3,101	5,264
Virginian	19,398	35,325	52	50	19,450	35,375
Western Maryland	34,532	52,247	349	546	34,881	52,793
Totals	1,073,431	1,055,909	97,325	78,931	1,170,756	1,134,840
Coke for Revenue and Fuel						
Baltimore & Ohio	112,263	167,211	59,948	80,773	172,211	247,984
Buffalo, Rochester & Pittsb'gh	5,812	16,976	24,067	35,722	29,879	52,698
Buffalo & Susquehanna	37,103	28,952	.....	23	37,103	28,975
Chesapeake & Ohio	49,910	44,073	4,385	6,143	54,295	50,216
Huntingdon & Broad Top Mtn.	5,258	2,505	1,061	5,157	6,319	7,626
Norfolk & Western	50,132	110,387	2,984	21,202	53,116	131,589
Pittsburgh & Lake Erie	26,068	35,739	380,436	298,938	406,504	334,677
Virginian	.....	.....	40	.....	40	.....
Western Maryland	2,891	3,579	22,951	39,377	25,842	42,956
Totals	289,437	409,422	495,872	487,335	785,309	896,757

SHIPMENTS FOR SEVEN MONTHS ENDING JULY

For Revenue Only						
Bituminous						
Baltimore & Ohio	17,248,735	21,566,378	6,014,287	7,115,280	23,263,022	28,681,658
Buffalo, Rochester & Pittsb'gh	3,178,588	5,101,726	218,954	110,442	3,397,542	5,212,168
Buffalo & Susquehanna	662,699	1,073,388	957	.....	663,656	1,073,388
Chesapeake & Ohio	12,674,465	14,019,051	1,273,210	1,510,170	13,947,675	15,529,221
Erie	149,675	269,075	3,180,345	5,360,071	3,330,020	5,629,146
Huntingdon & Broad Top Mtn.	433,846	457,576	6,568	136,088	440,414	593,664
N.Y. Central (Buffalo and east)	3,638,490	5,201,726	.....	.....	3,638,490	5,201,726
Norfolk & Western	11,114,391	11,401,225	1,398,805	1,800,980	12,513,196	13,202,205
Pennsylvania[b]	5,996,448	6,138,239	1,436,168	1,378,082	7,432,616	7,516,321
Pittsburgh & Lake Erie	3,280,923	2,629,718	3,678,244	3,246,474	6,959,167	5,876,192
Pittsburg & Shawmut	1,073,631	1,592,538	.....	.....	1,073,631	1,592,538
Pittsburg, Shawmut & North'n	237,972	449,879	165,260	189,523	403,232	639,402
Virginian	2,368,451	3,506,542	331,425	379,481	2,699,876	3,886,023
Western Maryland	2,079,617	2,970,271	3,734,594	3,617,849	5,814,211	6,588,120
Totals	64,137,931	76,377,332	21,438,817	24,844,440	85,576,748	101,221,772
For Company Fuel						
Bituminous						
Baltimore & Ohio	3,153,851	2,796,599	240,215	135,584	3,394,066	2,932,183
Buffalo, Rochester & Pittsb'gh	348,975	465,992	773	244	349,748	166,236
Buffalo & Susquehanna	41,806	62,806	.....	.....	41,806	62,806
Chesapeake & Ohio	1,060,114	1,380,318	.....	.....	1,060,114	1,380,318
Erie[a]	623,524	655,589	938,562	1,115,203	1,562,086	1,770,792
Huntingdon & Broad Top Mtn.	12,952	12,358	2,567	3,268	15,519	15,626
N.Y. Central (Buffalo and east)	974,214	848,974	.....	.....	974,214	848,974
Norfolk & Western	1,325,482	1,393,000	264,092	335,032	1,589,574	1,728,032
Pennsylvania[b]	1,796,501	1,620,808	74,080	181,760	1,870,581	1,802,568
Pittsburgh & Lake Erie	146,699	164,529	161,674	143,713	308,373	308,242
Pittsburg & Shawmut	18,447	25,528	.....	.....	18,447	25,528
Pittsburg, Shawmut & North'n	20,545	33,088	.....	.....	20,545	33,088
Virginian	167,146	264,392	1,693	4,482	168,839	268,874
Western Maryland	202,464	348,372	105,112	22,236	307,576	370,608
Totals	9,892,720	10,072,353	1,788,768	1,941,522	11,681,488	12,013,875
Coke for Revenue and Fuel.						
Baltimore & Ohio	645,375	1,068,185	371,072	564,816	1,016,447	1,633,001
Buffalo, Rochester & Pittsb'gh	126,712	123,276	159,603	235,940	286,315	359,216
Buffalo & Susquehanna	213,782	216,913	75	62	213,857	216,975
Chesapeake & Ohio	314,507	322,437	26,262	81,958	340,759	404,395
Erie[a]	53,406	103,438	128,565	236,819	181,971	340,257
Huntingdon & Broad Top Mtn.	50,458	38,129	2,567	3,268	53,025	41,397
Norfolk & Western	625,695	677,467	62,195	133,752	687,890	811,219
Pennsylvania[b]	1,265,973	1,183,676	312,270	208,775	1,578,243	1,482,451
Pittsburgh & Lake Erie	222,357	215,365	2,578,286	2,068,312	2,800,643	2,283,677
Virginian	.....	.....	165	.....	165	.....
Western Maryland	26,192	30,376	221,225	132,179	247,417	162,555
Totals	3,544,457	3,979,262	3,862,275	3,755,881	7,406,732	7,735,143

[a] Figures for six months, January-June. No report for July.
[b] Figures for two months, January-February.

Coal Mining Promises to Become Chief Industry of Formosa

Coal mining, according to the *Colliery Guardian*, promises to become the most important enterprise of the island of Formosa. Production has risen from less than 350,000 tons in 1914 to more than 1,000,000 tons in 1919, and it is estimated that by next year the mines will be close to a 2,000,000-ton basis.

In 1919 exports, principally to Hong Kong, the Philippine Islands, Shanghai and Singapore, accounted for approximately 480,000 tons; bunker sales were 100,000 tons; while Formosan consumption was estimated at 570,000 tons. The total coal deposits of Formosa are variously estimated at figures between 691,840,000 tons and 850,000,000 tons. Production could be greatly increased, and an output of as much as 5,000,000 tons per annum easy of attainment, were it not for defective harbor and transport facilities.

Reclamation of Belgian Mines Advances; Output Increasing

Since publication of the article "Reclaiming the Coal Mines of Lens," in *Coal Age*, Nov. 25, advices from the devastated region, according to the *Colliery Guardian*, state that No. 14 bis pit at Lens yielded 181 tons during September, and No. 22 pit at Courrières 11 tons. On the last day of October a small increase was noted at the former pit, and the output is now about 40 tons a day.

Cementation at Lens has been fully completed in 11 pits out of 130, which form the concession. Continuous pumping is to be undertaken at No. 10 and No. 10 bis pits, and the newly-erected pumping installations at No. 7 pit. The headgear of shaft No. 6 ter has been started at Marles. The aim is to double the 6-6 bis pit, and so make it an independent one for ventilation. The remodelling of No. 7 pit, and its use either as an upcast or winding shaft, are under consideration.

Washery Capacity 250 Tons Hour

The sinking of No. 2 pit ter is now fully completed. This pit is situated in an alluvial area near the La Clarence River and Béthune-Saint Pol Railway. Sinking was started at the end of 1917. The machinery consists of a battery of Buttner boilers (eight multitubular boilers) and a steam winding engine with an hourly capacity of 260 tons. Screening and washing plants are adapted to an output of 250 tons per hour.

Nearly 40,000 workers were employed in the collieries of Northern France during September, an increase of some 3,000 above June; 20,800 men are working on the surface and 19,000 underground. Deepening of the ventilation shaft (No. 2) at La Clarence is proceeding through the coal measures; the 1,000 m. level will be reached in about two years. The sinking of a shaft is under consideration at Ligny-lez-Aire Collieries.

M. M. Garland, Congressional Authority on Mining Affairs, Dies

MAHLON M. GARLAND, Representative-at-large from Pennsylvania, one of the union labor leaders of the House and chairman of the Committee on Mines and Mining, was found dead in his home at Washington from heart disease Nov. 19. Funeral services were conducted in Pittsburgh Nov. 22 in the presence of hundreds of friends and relatives and an official congressional delegation.

Mr. Garland, who was the House authority on mining affairs, was born in Pittsburgh, Pa., in 1856, and was mostly self-educated. He began work on a farm at the age of nine years and later learned the trade of puddling and heating. He joined the Amalgamated Association of Iron, Steel and Tin Workers, and in 1891 was elevated to the presidency of the association, which position he held for seven years. Mr. Garland had also been vice-president of the American Federation of Labor. Through lifelong association with mineral production Mr. Garland closely followed developments in the coal industry. He gave much attention to mining legislation and conducted a thorough investigation of the war-minerals situation. He was particularly interested in the relationships between capital and labor in the mining industry.

As a labor leader who also enjoyed the confidence of employers he was frequently called upon to advise labor and capital in industrial troubles. During the anthracite strike in 1902 Mr. Garland took an important part, and was selected by John Mitchell as labor's member of the arbitration commission, which, however, did not function, as an agreement was reached without referring the matter to an arbitration board.

He was appointed Collector of Customs of Pittsburgh by President McKinley in 1898 and served in that position under Presidents Roosevelt and Taft until 1915, when he resigned. Mr. Garland had also served as a member of the Select Council of the City of Pittsburgh for two terms, the Pittsburgh School Board for four years and the Borough Council of Edgewood, Pa., where he resided, for six years.

From 1915 until the time of his death Mr. Garland represented Pennsylvania in the House, where as chairman of the Committee on Mines and Mining he handled a variety of legislation having an important bearing on mining affairs. He also served as supreme dictator from 1914 to 1915 and from 1915 to 1919 as general dictator of the Loyal Order of Moose.

Coal-Mine Labor Prosperous

COMPARED with a year ago the number of employees in the bituminous coal mines, as reported by fifty-nine representative companies to the Bureau of Labor Statistics, was 5.7 per cent less in the first half month pay period of October, but the total amount of wages received by the smaller number of men was 33.6 per cent greater. In other words, the average income of all employees in these representative operations was at the rate of $181 per month in October, 1920, compared with $130 per month for the corresponding period of last year, an increase of more than 38 per cent. This is the best showing made in any of the thirteen manufacturing industries with which the Bureau of Labor Statistics compares these figures for bituminous coal.

In three industries other than coal mining, namely, the iron and steel, car building and car repairing, and the paper making industries, the increases in total payroll in October of this year compared with last year were greater than in bituminous coal, but in each of these others the increase in total payroll is mainly, if not entirely, due to a greater number of men and not to greater earnings per man. Compared with 33.6 per cent increase in payroll earnings indicated for the bituminous-coal industry, seven industries show a decrease, the greatest being 28 per cent in boots and shoes, 21 per cent in leather and in hosiery and underwear, and 13 per cent in cotton finishing and 12 per cent in automobiles.

When comparing October, 1920, with September, 1920, five of the fourteen industries show an increase in the amount of money paid to employees, bituminous coal being the leader, and nine show a decrease. Of these two recent months the largest decrease in payroll earnings occurred in cotton manufacturing, with 23 per cent, and cotton finishing, with 17.5 per cent. With respect to the number of men employed in October compared with September, the woolen industry alone records a measurable increase, bituminous coal showing practically no change and the automobile and men's clothing industries showing the largest decreases.

Amounts of Coal Moved by Railroads

IN A TABULATION of freight handled by Class 1 railroads, having annual operating revenues above $1,000,000, for the months of April, May and June, 1920, the Interstate Commerce Commission gives the following figures on coal and coke:

Anthracite coal—644,788 cars, amounting to 31,129,687 tons.

Bituminous coal—2,908,406 cars, amounting to 144,470,058 tons.

Coke—265,193 cars amounting to 9,432,251 tons.

By districts the coal handled was as follows:

Eastern—Anthracite coal, 614,638 cars of 30,052,775 tons; bituminous coal, 1,758,966 cars of 90,227,569 tons; coke, 189,412 cars of 6,933,980 tons.

Pocahontas—Anthracite coal, 922 cars of 44,944 tons; bituminous coal, 250,776 cars of 13,626,733 tons; coke, 14,725 cars of 512,091 tons.

Southern—Anthracite coal, 1,179 cars of 42,554 tons; bituminous, 350,801 cars of 16,678,585 tons; coke, 27,348 cars of 934,599 tons.

Western—Anthracite, 28,049 cars of 989,414 tons; bituminous, 547,863 cars of 23,937,171 tons; coke, 33,708 cars of 1,051,581 tons.

CARLOADS OF BITUMINOUS coal dumped by the Pennsylvania R.R. at Lake Erie ports and Atlantic tidewater piers between May 1 and Oct. 1 were as follows:

	Tidewater	Lake
May	11,200	3,912
June	13,312	6,823
July	14,397	11,361
August	20,099	21,750
September	20,899	25,180

THE JOINT COMMITTEE, representing operators, wholesalers and retailers, which is compiling figures which must be obtained from the three sources, is marking time awaiting the gathering by each group of the necessary basic information. The personnel of the committee is as follows: Operators, Colonel D. B. Wentz, J. A. Walsh and D. W. Buchanan; wholesalers, C. L. Couch, Borden Covel and Noah H. Swayne; retailers, John Lloyd, W. A. Smoot and Michael Burns.

AN AUCTION SALE of 5,000 acres of timber, coal and mineral lands near Cumberland and Georges Creek coal basin, Md., was held at Cumberland, Md., Nov. 20. The property consists of a part of the Hoyes Coal, Iron and Lime Discovery and General Duff Green's iron ore lands. The property is two miles from stations on the main line of the Baltimore & Ohio R.R. and the Western Maryland railroad.

Anthracite Shipments Cut by Strikes

SHIPMENTS of anthracite for the first seven months of the coal year 1920-21 (April 1 to Oct. 31), as reported to the Anthracite Bureau of Information at Philadelphia, have amounted to 39,720,654 gross tons, as compared with 41,771,313 gross tons for the same period last year. The decreased tonnage this year was, as shown in the following table, due almost entirely to the outlaw railroad switchmen's strike in April and to the "vacation" strike of the miners in September. The average shipments for the five normal months were 6,262,699 tons. The shipments in April fell below this figure by 1,448,486 tons, while the loss in September, due to the vacations, was 2,669,743 tons, so that the total shipments for the period are something more than 4,000,000 tons below what they would have been except for these two unauthorized interruptions to regular production. Shipments by initial carriers were as follows:

	April	May	June	July
P. & R. Ry.	1,055,190	1,298,295	1,165,339	1,251,791
L. V. R.R.	898,929	1,130,707	1,150,977	1,217,642
C. R.R. of N. J.	305,465	483,352	525,666	536,419
D. L. & W. R.R.	545,419	844,464	891,481	908,538
D. & H. Co.	833,254	845,033	901,325	893,358
Penna. R.R.	408,490	438,144	497,953	560,665
Erie R.R.	346,144	643,930	710,212	547,919
N. Y. O. & W. Ry.	160,306	173,913	176,604	177,427
L. & N. E. R.R.	261,014	298,040	300,400	295,341
Totals	4,814,211	6,155,878	6,319,957	6,389,100

	August	September	October	Totals, 7 mos.
P. & R. Ry.	1,401,849	537,176	1,317,070	8,026,710
L. V. R.R.	1,159,816	534,440	1,180,270	7,272,781
C. R.R. of N. J.	510,593	348,978	486,609	3,197,082
D. L. & W. R.R.	878,222	642,016	846,054	5,556,194
D. & H. Co.	917,579	736,160	893,058	6,019,767
Penna. R.R.	513,233	243,540	484,940	3,146,965
Erie R.R.	358,740	285,074	531,598	3,423,617
N. Y. O. & W. Ry.	177,151	149,260	190,958	1,205,619
L. & N. E. R.R.	290,470	116,310	310,344	1,871,919
Totals	6,207,653	3,592,954	6,240,901	39,720,654

Lieb Says Operators Observe Contracts; Blames I. C. C. for Car Shortage

MUCH less violent in his remarks on the attitude of the coal industry to the public utilities than Mr. Aylesworth at the annual meeting of the National Association of Railway and Utility Commissioners in Washington recently was J. W. Lieb, chairman of the National Committee on Gas and Electric Service, in his address before the American Gas Association in New York last week.

Mr. Lieb puts the entire blame for the utilities coal shortage on the Interstate Commerce Commission. He exonerates the coal shippers from the charge of non-fulfillment of contracts. Reviewing conditions since spring Mr. Lieb said:

"During the week ending Nov. 13 the National Association of Railroad and Public Utility Commissioners held its annual convention in Washington, bringing together representatives of the Public Service Commissions throughout the country. The National Committee on Gas and Electric Service felt that it was its duty to bring to the attention of this convention the extremely serious and dangerous condition of coal supply as applied to public utilities and a letter (*Coal Age*, Nov. 18, page 1059) was addressed to them. This letter was intended merely to call the convention's attention to the deplorable situation, but did not request or suggest any specific official action. When the matter was brought up, however, it created considerable discussion and Interstate Commerce Commissioners Clark and Aitchison, who were present, both took occasion to address the convention, taking a much less definite position than was to be expected from public officials who must realize what the public utilities of the United States are confronted with and how serious and disastrous would be the consequences to the public of a suspension of the important services which they render.

"It was represented by these commissioners that the public utilities were endeavoring to use the Interstate Commerce Commission to enforce their coal contracts, while the real situation is that there is no dispute whatever regarding coal contracts. The coal producers show their willingness to ship if they can get sufficient cars, either through distribution or by assignment. They do not dispute these contracts and no questions of that nature are involved, but the entire matter resolves itself into the fact that the Interstate Commerce Commission is merely being requested to invoke the provisions of Service Order No. 21, which was promulgated by it in order to furnish sufficient cars at the mines to ship public utilities coal which they had already bought to cover their requirements.

"Another statement made was that the public utilities, notwithstanding the fact that they had contracted for their coal, should now go out in the open market and buy 'spot' coal to make up for lack of deliveries, due largely to inadequate transportation facilities, and pay the prevailing excessive prices, regardless of the fact that they had already covered themselves for their requirements by proper contract. The only real obstacle confronting them in the way of getting these contracts filled to meet their requirements is lack of carrying capacity of the railroads over which the Interstate Commerce Commission has complete and absolute jurisdiction.

"On the following day a place on the program was given the secretary of the National Committee on Gas and Electric Service, and the situation as it existed was presented to the Commissioners by him and discussed by the convention, resulting in the introduction of a resolution calling upon the Interstate Commerce Commission to arrange to place sufficient cars at the mines to carry to public utilities coal supply necessary for their daily operations, and thereby prevent an impending calamity.

"The utilities now find themselves at the very gates of winter, generally speaking, with little or none of the storage or reserve fuel supplies usually accumulated, and in many cases with hardly enough fuel obtainable to carry on each day's operations.

"It is probable that immediately upon the convening of Congress we shall receive requests for all the information which we can obtain as to the coal supply necessary for the operation of public utilities, the required reserves to be carried in storage, etc., as it seems inevitable that some legislation will be proposed looking forward to the elimination of some of the difficulties which have been experienced in the protection of the coal supply necessary to maintain the service of the public utilities."

Division on Prepayment Requirement Foreshadows Its Withdrawal

THE Interstate Commerce Commission has approved the tariff requiring prepayment of charges on shipments into Canada in so far as it applies to the charges for transportation within the United States. The charges or divisions which occur beyond the frontier may be collected at destination.

To comply with this opinion it will be necessary for the railroads to publish the division of the rate which applies to transportation within the United States. As this applies to such a large number of points of destination the difficulties of making this publication are such that it is believed that the railroads will do away with prepayment requirements of their own volition. This case has been pushed by the American Wholesale Coal Association. A conference is now being arranged by that organization with the representatives of the railroads, with the idea of discussing voluntary withdrawal of the prepayment requirements.

CO-OPERATION OF THE National Coal Association has resulted in the Government fuel yard at Washington, which supplies public buildings in the national capital with coal, obtaining fuel at reasonable prices, according to a report submitted to Director Cottrell of the Bureau of Mines by George S. Pope, chief engineer in charge of the yards. Mr. Pope points out that the yard failed to receive bids when it asked for 250,000 tons of bituminous coal this year, whereupon he took up the matter with the National Coal Association and through its support he has obtained coal at $4.25 per net ton at the mine. Mr. Pope also discusses the quality of coal in his report.

Fuel Freight Increases 22 to 90 Per Cent

IN a report on freight operating statistics of railroads the Interstate Commerce Commission gives reports of the cost per freight train-mile for fuel for August, 1920, compared with August, 1919, and from January to August, 1920, inclusive. The figures are as follows:

COST PER FREIGHT TRAIN-MILE FOR FUEL
First Eight Months of 1920

Region	Jan.	Feb.	Mch.	Apr.	May	June	July	August
New England...	$0.798	$0.956	$0.824	$0.899	$0.819	$0.901	$1.040	$1.067
Great Lakes....	.684	.718	.630	.634	.647	.662	.661	.702
Ohio-Ind.-Allegheny.....	.568	.576	.534	.585	.569	.605	.594	.693
Pocahontas.....	.606	.602	.587	.609	.638	.869	.779	.861
Southern.....	.451	.480	.430	.455	.451	.449	.468	.29
Northwestern...	.636	.634	.560	.559	.527	.545	.523	.601
Central Western	.618	.554	.551	.561	.539	.555	.556	.593
Southwestern...	.583	.527	.526	.527	.614	.518	.506	.588
All regions.....	.598	.593	.551	.569	.563	.583	.584	.648

August, 1920, and 1919 Compared

	August, 1920	August, 1919	Increase Amount	Increase Per Cent
New England.....	$1.067	$0.561	$0.506	90.2
Great Lakes.....	.702	.451	.251	55.7
Ohio-Ind.-Allegheny.....	.693	.404	.289	71.5
Pocahontas.....	.861	.502	.359	71.5
Southern.....	.529	.362	.167	46.1
Northwestern.....	.601	.483	.118	24.4
Central Wester.....	.593	.487	.106	21.8
Southwestern.....	.588	.434	.154	35.5
All regions.....	.648	.445	.203	45.6

Railroads Continue to Surpass Pre-War Records for Freight Movement

FOR the third successive month, Class 1 railroads of the United States moved more freight during September than was ever transported in a single month either during Government control or the pre-war period, according to data just compiled by the Bureau of Railway Economics.

The net ton-miles (the number of tons of freight multiplied by the number of miles they were carried) totaled for September 40,999,843,000. This was 1,706,992,000 net ton-miles less than the total for August, but was 564,335,000 greater than the net ton-miles for July, which, according to the Interstate Commerce Commission in a recent statement, was greater than for any month previously recorded. The total for September also exceeded that for the same month last year by 2,139,532,000.

Part of the difference between the net ton-miles for September and August resulted from a temporary lull in industrial activity due to the observance of Labor Day, together with the fact that there is one less day in September than in the previous month.

The goal set by the railway executives—to attain an average loading of thirty tons for each loaded freight car—was realized during September, when that mark was reached by the Class 1 railroads of the country.

The average freight car during September carried a greater load of freight than for any month in the last four years with the exception of July and August in 1918, when the average for each month was only $\frac{1}{10}$ ton greater. The September average also marks an increase of $\frac{1}{2}$ ton over that for August. For September, 1919, the average was $28\frac{3}{10}$ tons and for the same month in 1918, $29\frac{7}{10}$ tons.

During September the roads also continued to progress in their efforts to speed up the movement of freight cars. Statistics prepared by the Bureau of Railway Economics show that during the month an average daily movement per car of $28\frac{1}{10}$ miles was attained. This figure exceeded the average for any month during Federal control and was surpassed only during June and July, 1917. During last August the average was $27\frac{3}{8}$ miles, while for September in 1919 and 1918 it was $26\frac{1}{2}$ and $26\frac{3}{4}$ miles, respectively.

PROF. HORACE W. KING, engineer of the Geological Survey, who was appointed during the war to make power investigations in connection with the conservation of fuel, has resigned from the service.

IN LETTERS TO the Bureau of Mines, officials of the Department of Agriculture and the Bureau of Engraving and ing commend the service of the Government Fuel Yards, operated by the Bureau of Mines, in handling coal for these buildings. The Chief Clerk of the Agricultural Department writes that it has had satisfactory service from the bureau since it took over the distribution of coal to Government departments. The Director of the Engraving and Printing Bureau says the fuel yards are to be congratulated upon the successful manner in which coal has been handled. The bureau, he says, has never had better deliveries.

AN ARRANGEMENT HAS recently been made by the U. S. Bureau of Mines and the U. S. Geological Survey, whereby data needed by the Bureau of Mines in regard to coal-mining methods and operations will be collected by the Geological Survey on the same blank which it sends out for the collection of its annual statistics on coal production. This arrangement will be somewhat less convenient for the two bureaus, but their directors feel that, as so many demands for reports are made upon the operators, it is only fair that, even at some inconvenience to themselves, they should reduce these demands to the minimum.

THE AMERICAN FEDERATION OF LABOR announces that it contemplates a campaign of Americanization among the foreign working element, especially in the coal fields, to offset radicalism.

THE CHIEF OF THE transportation service of the army in his annual report, made public Monday, Nov. 29, says the army has under short-term charter and released from day to day, fourteen coal boats in the port of New York, used in connection with the fueling of the army transport fleet. These boats will not be necessary on the completion of the War Department-owned equipment now under construction for that class of service.

EFFORTS OF THE Department of Labor to settle the long pending strike in the Alabama coal fields are not producing immediate results, according to latest reports to the department. Some time ago a conciliator, W. C. Liller, was assigned to settle the differences between the miners and operators over the question of unionizing the mines, but Mr. Liller reports that although he has taken up the question and also has conferred with Governor Kirby and Senator Underwood at Birmingham prospects of bringing the parties together on a settlement basis are not favorable.

GEORGE W. HOLLARD, of the Geological Survey, has returned to Washington from a Western trip on which he collected valuable data for use in the administration of the coal sections of the Mineral Leasing Act.

Operators Expectant on Coal Legislation As Congressional Session Begins

TALK of radical legislation is discounted by J. D. A. Morrow, the vice-president of the National Coal Association. He feels quite certain that Congress will get the full facts before passing any law and, in his opinion, the legislators soon will find that the only trouble with coal during the last season was transportation. There must be more cars, more locomotives and greater efficiency in their handling, Mr. Morrow believes.

Due to the necessity of action on the appropriation bills, there is little chance of coal legislation at the short session. There is every indication, however, that coal will come in for active consideration in committees. As an extra session is to be called within a month after the adjournment of the short session, hearings could be completed during the short session and everything made ready for contemplated legislation at the beginning of the extra session.

Senator Calder is reputed to have in his inside pocket the draft of his bill providing for some type of Government intervention in the handling of coal in times of emergency. Mr. Calder, however, states that he has not yet made up his mind as to what legislation should be proposed.

There is a feeling among some that some regulation of organized labor must be devised to protect the public against curtailment of its coal supply. This is aimed not only at the employees within the mines but at labor employed in the train service at terminals and at the docks.

Senator Cummins, of Iowa, chairman of the Senate Interstate Commerce Committee, announces that if Congress provides for government regulation of coal production and prices he will propose an anti-strike provision to apply to coal mines so as to assure continuous output, similar to the proposed anti-strike legislation for railroads.

THE ANNUAL MEETING of the Smokeless Coal Operators' Association of West Virginia will be held at the Bellevue-Stratford Hotel, Philadelphia, Tuesday, Dec. 14, at 11 a.m. Reports of the retiring officers and the election of members of the Board of Governors and of the Membership Committee for the coming year constitute the program. Arrangements have been made for the usual luncheon, which will be served after the morning session. In order that the hotel may be advised of the number who will attend J. J. Tierney, president, asks that all who expect to attend notify him at 1503 North American Building, Philadelphia.

Production of Pennsylvania Anthracite Gains 8.8 Per Cent in Ten Years With 13 Per Cent Fewer Miners

CENSUS returns on the anthracite industry of Pennsylvania for the calendar year 1919 have just been released in a preliminary statement prepared by F. J. Katz. These statistics are the result of tabulations of the "general schedules" of the Bureau of Census as distinguished from the supplemental schedules, the returns from which were recently published by the Geological Survey.

The tabulations of the census cover such items as invested capital and certain details of costs not represented in the annual statistics of the Geological Survey. The summary shows a decrease in the number of breakers and also in the number of wage earners employed. The number of wage earners decreased from 169,174 to 147,069, or 13 per cent, during the decade 1909 to 1919, while the wages paid show an increase from $92,169,906 to $210,202,511. For operating cost a decided increase in shown. The quantity of coal produced shows but a slight increase over that for 1909, this increase being but 6,302,000 tons, or 8.8 per cent, while the value of the coal produced increased from $145,881,000 to $364,243,000.

The statistics for 1919 are presented in groups representing the three major divisions or trade regions of the anthracite producing fields, and they are also segregated in so far as possible by types of operations. The 1919 statistics for the three trade regions bring out only minor differences in conditions, except that dredging operations are centered in the Schuylkill region and are insignificant in the others.

The types of operations considered comprise: (1) Colliery operations, or production of freshly mined coal, with which there are necessarily included a large number of culm washery operations conducted by the colliery establishments and therefore not separately reported. However, the scale of washery operations and the size of figures pertaining to them are so small in comparison with colliery figures that the statistics for the latter are not significantly modified by the inclusion of the washery data; (2) culm-bank washery operations. The compilation given for these represents a small number, but, nevertheless, a typical group of such operations; (3) dredging operations. The statistics given for dredges include all returns on dredges.

PRELIMINARY STATEMENT OF PENNSYLVANIA ANTHRACITE OPERATIONS, 1919

	1919	1909	1919 — Trade Regions			1919 — Types of Operation		
	Totals	Totals	Wyoming Including Bernice Basin	Schuylkill	Lehigh	Collieries (Including Culm Washeries Not Separately Reported)	Culm-bank Washeries Independently Reported	Dredges
Number of reporting establishments	* 250	† (0)	98	128	24	151	18	81
Number of plants:								
Breakers	256	305	147	80	29	256	..	..
Mines	335	(2)	212	85	38	335	..	..
Culm washeries	79	52	43	25	11	61	18	..
Dredges	81	63	3	75	3	..	..	81
Number of persons employed:								
Salaried employees	6,972	4,302	3,984	2,251	737	6,869	56	47
Wage earners	147,069	169,174	84,858	43,785	18,426	146,339	366	364
Invested capital	$432,391,597	$246,713,318	$243,035,343	$131,218,644	$58,137,610	$429,268,788	$1,543,343	$1,579,466
Expenses (selected items):								
Salaries	13,024,557	4,572,489	7,109,762	4,334,663	1,580,132	12,828,671	134,375	61,511
Wages	210,202,511	92,169,906	120,105,650	63,560,062	26,536,799	209,390,984	424,971	386,556
Materials and supplies	60,098,707	23,472,809	35,469,133	17,074,726	7,554,848	59,656,391	253,796	188,520
Fuel	12,334,449	.....	7,538,982	2,768 352	2,027,115	12,260 864	17,181	56,404
Power purchased	1,868,915	3,189,279	617,308	605,597	64 ,010	1,800,066	58,788	10,061
Contract work	1,582,327	1,701,514	548,784	418,378	615,165	1,526,908	53,691	1,728
Rent and royalties	11,762,958	7,969,785	5,838,996	4,256,469	1,667,493	11,401,519	342,614	18,825
Taxes	14,066 012	3,356,809	9,849,191	1,875,8 5	2,341.016	14 056,216	7,305	2,491
Production:								
Total gross tons produced	78,566,868	72,215,273	43,902,008	23,334,135	11,330,725	77,369,758	591,945	605,165
Value of mines	$364,243,423	$145,880,526	$212,315,434	$100,958,590	$50,969,399	$361,397,515	$1,951,077	$894,831

* Number of individual reports furnished by 200 operators.
† Comparable figures not available.

Anthracite Investigated by Senate Committee

INVESTIGATION into the coal industry, and more especially into the so-called shortage of coal, by the Senate Reconstruction Committee, of which Senator William M. Calder is chairman, was resumed in New York City Saturday, Dec. 4. The entire day was given up the the examination of witnesses with regard to anthracite, the committee being assisted by Harry E. Lewis, District Attorney of Kings County.

W. H. Williams, vice president of the Hudson Coal Co., was the principal witness of the day, occupying the witness chair during part of both morning and afternoon sessions. Mr. Williams attributed the so-called shortage to a desire of everyone to get an entire fuel supply at one time and told the committee that New England dealers were trying to obtain more coal than they were entitled to. He said his company had given the New England States their pro-rata share of coal.

Replying to a question by Mr. Lewis if he would store coal in New York State, Mr. Williams said he would if the law would allow it. He said he could store coal in Pennsylvania, but that a railroad company cannot own the coal it mines when it crosses the state line.

The first witness of the day was Eugene C. Hultman, Fuel Administrator of Massachusetts, who told of the shortage existing in his state and gave to the committee the names of several wholesale dealers who he said had charged in excess of $9.50 at the mines for domestic sizes.

Other witnesses included J. W. Lieb, vice president of the New York Edison Co., and I. R. Schumaker, of the East Boston Coal Co. Mr. Schumaker told the committee that he had sold coal as low as $8.75 and as high as $15 f.o.b. mines and that his average price was $11.11 per ton.

Any subsequent hearings by the committee will be held in Washington.

Anthracite Producers Agree to Co-operate With Fair Practice Committee

ANTHRACITE operators and members of the Fair Practice Committee recently appointed for the anthracite industry, with whom the Department of Justice is co-operating, held a conference in Philadelphia, Nov. 29, 1920, at which time complete co-operation with the committee's work was tendered by the representatives of the producers. This was the second meeting within a week and it was presided over by Percy C. Madeira, chairman of the Fair Practice Committee. The U. S. Department of Justice was represented by Special Agent Campbell.

The committee about two weeks ago sent out a general letter to the trade, outlining its program and the general results it wished to obtain in the way of eliminating undue charges for coal at the mines, if any such charges existed, and arranging for equitable distribution of domestic anthracite with particular reference to Eastern communities where shortages were reported.

Through the co-operation of producers, results have been attained in both directions. The extreme peak of mine prices, which had been asked on a very small proportion of the total output, when compared with the reasonable prices charged for a large proportion of the production, has been substantially lowered. It is recognized that the largest possible output of domestic anthracite is desirable at this time, and that in order to attain the highest possible output mine prices must be allowed to some producers which will adequately cover their exceptional costs owing to thin veins, long and expensive haulage inside, extraordinary water conditions or other factors which increase the expense of mining. However, the aggregate tonnage from mines of this character is small in comparison with the great proportion of the output for which moderate stabilized prices are being asked.

Undue charges upon coal after it leaves the mine and before it gets to the retailers' yards are being held in check by the committee and the producers through a resolution adopted by the committee that there shall be but one wholesaler's profit between the producer and the retail dealer, and that where the producer does not sell direct to the dealer, the total of such profit shall in no case exceed 8 per cent of the mine price. This 8 per cent would apply no matter how many hands the coal passed through between the mine and the retailer's yard, but as a matter of fact the committee has acted to prevent the useless handling of coal by recommending that those anthracite producers who sell through wholesale houses stick to their established firms and not deal with "fly-by-night" jobbers, who, it is pointed out, have been responsible to a considerable degree for the high prices retailers have been asked to pay in some quarters.

Progress is being made in the distribution of domestic coal in cities reporting shortages, and in this the committee is helped by the fact that at this time of year a larger proportion of the output is customarily marketed in the East, owing to the ending of the Lake navigation season. The real cause for complaints of shortage, and incidentally one of the chief causes for such bidding up of prices as may have existed, lies in the fact that anthracite production for the first seven months of this coal year, beginning April 1, 1920, has been short more than 2,000,000 tons compared with the same period last year.

Part of the shortage is due to the outlaw strike of the railroad switchmen last April, which hampered transportation and resulted in anthracite shipments of a little more than 4,800,000 tons for that month, as compared with an average of about 6,300,000 tons for May, June and July, when normal transportation conditions prevailed. A further loss came in September, when the miners went on a "vacation" strike and cut the month's output to less than 3,600,000 tons compared with 6,207,653 tons in the preceding month, the losses being augmented by minor strikes, vacations and an unusually large number of voluntary holidays taken by miners. These losses—more than 2,000,000 tons if this year be compared with last and a little more than 4,000,000 tons if the average shipments of 6,262,699 tons for the five normal months of the current coal year be the basis of comparison—are more than sufficient to account for any anthracite shortages reported to date.

Indiana Fuel Board Endeavors to Solve Coal Problems Despite Injunction

BECAUSE of the delicacy of the situation no statement of the status of the Special Coal and Food Commission of Indiana in view of the temporary injunction issued by the Federal court restraining it from enforcement of its orders will be ventured by the commission, it was announced at its offices. The commission still has to go before the court and oppose the issuance of a permanent injunction, and meanwhile it will try to avoid arousing prejudice, it was said.

The commission will continue to act as a clearing house for communities which have not sufficient coal and for such coal operators as will co-operate with it, and will endeavor to get coal to the communities as before. The arrangement, however, will depend on the willingness of the operators to comply with the commission's requests.

The leading bituminous-coal operators of Indiana, according to A. M. Ogle, president of the Vandalia Coal Co., will do everything in their power to take care of any fuel shortage that many develop in Indiana, and as individuals will use their moral influence to hold prices within reasonable limits, in spite of the fact that the coal consumers of the state who may need relief would likely be those who ordinarily do not support the Indiana coal industry but buy their coal from outside the state.

IN A COMPLAINT to the Interstate Commerce Commission the Hazard Coal Operators' Exchange alleges that the Louisville & Nashville R.R. has failed to furnish transportation for recently developed coal fields in eastern Kentucky. The commission is requested to direct the railroad to provide additional transportation facilities in the way of tracks, engines and coal cars to afford adequate transportation facilities for this coal.

Pennsylvania Railroad Surpasses Goal Set in Elimination of Bad-Order Cars

REPORTS just compiled show that the Pennsylvania System has passed the bad-order freight-car goal set for the whole country by reducing the ratio of unserviceable freight cars to total freight cars on line from 11.9 per cent on Oct. 1, 1919, to 3.6 per cent as of Oct. 1, 1920. This betters the figure of 4 per cent which was set as an aim for the entire country by the Association of Railroad Executives in the recent national campaign for more efficient transportation.

On Feb. 28, 1920, the day on which Government control ended, bad-order freight cars on the Pennsylvania's lines numbered 23,444—8.4 per cent of the total freight cars owned and 8 per cent of the total number of freight cars on the lines. Since that time there has been a fairly steady reduction, with some weekly ups and downs, until information now available shows that the Pennsylvania System's unserviceable cars numbered on Oct. 1 only 4 per cent of the total cars owned and 3.6 per cent of the total number of freight cars on the line. The average daily number of bad-order freight cars on the system has been brought down from 25,531 during March, 1920, to 10,136 during September.

Although the 4 per cent bad-order goal set by the Association of Railway Executives has been reached and passed by the Pennsylvania, efforts in this direction will be continued, to effect still further reduction in the number and percentage of bad-order freight cars.

I. C. C. Suspends Modified Demurrage Charges and Rules Pending Hearing

PROPOSED changes in car demurrage charges and rules were suspended by the Interstate Commerce Commission in a notice designated Investigation and Suspension Docket No. 1,249, First Supplemental Order, issued Dec. 1, which reads as follows:

"It appearing that there have been filed with the Interstate Commerce Commission by the Newburgh & South Shore Railway Co. and the Illinois Terminal Railroad Co. tariffs containing schedules stating new individual rates and charges, and new individual regulations and practices affecting such rates and charges, to become effective, except as otherwise noted herein, on the 15th day of December, 1920, designated as follows: The Newburgh & South Shore Railway Co.: I. C. C. No. 46; Illinois Terminal Railroad Co.: I. C. C. No. 458, effective Jan. 1, 1921,

"It is ordered that the commission upon complaint, without formal pleading, enter upon a hearing concerning the lawfulness of the rates, charges, regulations and practices stated in the said schedules contained in said tariffs. viz.: The Newburgh & South Shore Railway Co.: I. C. C. No. 46, on pages 6, 7, 8 and 9 thereof, Rules 7, 8 and 9; Illinois Terminal Railroad Co.: on pages 6, 7, 8 and 9 thereof, Items 7, 8 and 9.

"It further appearing that said schedules make certain increases in rates for the interstate transportation of various commodities and the rights and interests of the public appearing to be injuriously affected thereby, and it being the opinion of the commission that the effective date of the said schedules contained in said tariffs should be postponed pending said hearing and decision thereon;

"It is further ordered that the operation of the said schedules contained in said tariffs be suspended, and that the use of the rates, charges, regulations and practices therein stated be deferred upon interstate traffic until the 14th day of April, 1921, unless otherwise ordered by the commission, and no change shall be made in such rates, charges, regulations and practices during the said period of suspension unless authorized by special permission of the commission.

"It is further ordered that the rates and charges thereby sought to be changed shall not be increased and the regulations and practices thereby sought to be altered shall not be changed by any subsequent tariff or schedule, until this investigation and suspension proceeding has been disposed of or until the period of suspension and any extension thereof has expired, unless authorized by special permission.

"And it is further ordered that a copy of this order be filed with said schedules in the office of the Interstate Commerce Commission, and that copies hereof be forthwith served upon the Newburgh & South Shore Railway Co. and the Illinois Terminal Railroad Co., and that said carriers be, and they are hereby, made respondents to this proceeding, and that they be duly notified of the time and place of the hearing above ordered."

Operating Costs for Second Quarter of 1920 Reviewed by Federal Trade Commission

AVERAGE sales realization and revised costs of 566 operators producing about 19 per cent of the total bituminous coal mined in the United States during the second quarter of 1920 are reviewed by the Federal Trade Commission in a recent bulletin. Since 1918 the probable increase in costs due to the wage advances has averaged 45c. per ton, or 30 per cent, for labor, and 52c. per ton, or 25 per cent, for total f.o.b. mine cost.

The average sales realization of 566 opperators in the second quarter of 1920 was $3.31 per ton and their revised f.o.b. mine cost was $2.66 per ton. Of this cost $2.04 per ton represented labor; 30c., supplies; and 32c. general expense (or overhead). The difference between the sales realization and the total f.o.b. mine cost is the "margin," which averaged 65c. per ton. This "margin" is not the same as profit. "In order to arrive at the amount available for income and excess profits taxes, dividends, or surplus there must be deducted certain items, such as selling expenses and interest on borrowed capital, and there must be added certain items, such as income from outside investments."

These average figures for companies in all parts of the country should not be considered applicable to any one region or district, because of marked variations in costs and in sales realizations. Labor cost in the Central Competitive "Interstate" Region (which produced 33 per cent of the total tonnage of the 566 operators) was 17c. per ton below the average labor cost ($2.04 per ton); and in the Southwestern "Interstate" Region (which produced 6 per cent of the total tonnage) was 76c. per ton above the average. Average sales realizations by regions ranged from $3.05 per ton in the Central Competitive "Interstate" Region to $3.74 per ton in the Southwestern "Interstate" Region.

By districts, within the six major regions, the report shows that 52 districts, producing 8,940,751 tons, had an average margin of 31c. per ton, or 34c. per ton *below* the average margin (65c.) of the 566 operators for the United States as a whole. In twenty-seven districts, producing 7,529,490 tons, the margins realized averaged $1.03 per ton, or 38c. per ton above the average for the United States. The remaining nine districts produced 6,502,493 tons at an average margin of 64c. per ton.

Comparing April, May and June the report shows that the average sales realization of the 566 identical operators for all regions combined increased from $3.18 per ton in April to $3.26 in May and to $3.45 for June. Costs only increased from $2.68 per ton in April to $2.69 in May, but dropped to $2.62 in June.

Gibbs L. Baker Testifies on Misuse of Shipping Permits

IN connection with charges of corruption of railroad officials and employees by shippers endeavoring to obtain cars and permits for the shipment of coal, Gibbs L. Baker, general counsel of the Wholesale Coal Association of New York, on Saturday, Dec. 4, stated before Commissioner Aitchison, who is conducting the inquiry, that he had been informed in conversation with William S. Coale, of Cumberland, Md., of Coale & Co., of New York, that a representative of the American Fuel & Shipping Co. in September had obtained from an official of the Baltimore & Ohio Railroad Co. a permit for a large shipment of coal, approximately 100,000 tons, and had paid the railroad official $4,000 in connection with the matter. The coal, he said, was con-

signed to ships waiting for loading, and fictitious names of vessels were furnished. Mr. Baker stated that the B. & O. conducted an investigation into the charge, but that he (Mr. Baker) did not know the name of the official reported to be implicated.

Mr. Baker gave further hearsay evidence regarding the use of permits by the Davis Coal Co., of Morgantown, W. Va.; Henley & Co., of Baltimore, and Bradford & Co., of New York. William M. Speare, assistant U. S. Attorney at New York, also was quoted regarding misuse of shipping permits.

Mr. Baker denied previous statements ascribed to him and quoted by P. J. Farrell, chief counsel of the Interstate Commerce Commission, stating only that he had information that certain irregularities had been practiced in granting permits for the shipment of coal and the distribution of cars. In conclusion Mr. Baker said: "It has not come to my attention either directly or indirectly, nor do I think that any official or employee of the Interstate Commerce Commission had anything to do with any irregularities."

Prepayment Requirement on Shipments to Canada Is Restored

THE Interstate Commerce Commission on Nov. 27 issued the following order, designated Investigation and Suspension Docket No. 1,213, regarding prepayment of freight charges to points in Canada:

"It appearing that by order dated Oct. 4, 1920, the commission entered upon a hearing concerning the lawfulness of the regulations and practices stated in certain schedules contained in F. A. Leland, Agent, Supplement No. 11 to tariff I. C. C. No. 1,334, and suspended the operation of said schedules until Feb. 2, 1920;

"It further appearing, that on Nov. 17, 1920, in Investigation and Suspension Dockets Nos. 1,191, 1,191-No. 2 and 1,196, the commission found that respondents had justified proposed tariff rules requiring payment of charges in U. S. currency and vacated its orders of suspension in those cases, and good cause appearing therefor;

"It is ordered that the said order of Oct. 4, 1920, in this proceeding, be, and it is hereby, vacated and set aside as of Nov. 29, 1920, and that this proceeding be discontinued."

Martial Law Declared in Mingo County

GOVERNOR JOHN J. CORNWELL declared martial law in Mingo County on Nov. 29, Colonel Herman Hall commanding the provisional battalion of Federal troops from Chillicothe having found it necessary to publish a proclamation forbidding public assemblies except such as might be held regularly in organized churches. Governor Cornwell declared that Mingo County was in a state of insurrection.

Judge R. Bailey, of the Mingo Circuit Court, in a statement declared that the reason for the disorder was the inadequate budget appropriation for Sheriff Blankenship—$10,000. No emergency fund being available, no extra deputy sheriffs could be employed.

The decision of Governor Cornwell was made none too soon, for several acts of violence occurred and on the Kentucky side continue to occur. On Nov. 30 at Baranshee, on the Kentucky side of the Tug River, where the troops were not available to enforce martial law, two deputy sheriffs were wounded, one seriously, when they attempted to make an arrest. In West Virginia also on Nov. 28 two soldiers stationed at Rose Siding were fired on. L. E. Armentrout, manager of Mine No. 12, Borderland, W. Va., reported that a motorman at his mine was fired on when he tried to remove an obstruction on the track between the mine and the tipple, the shooting coming from the Kentucky side.

Colonel Hall's troops have seized several hundred guns and pistols since martial law went into effect. No person other than the regularly-constituted authorities may carry or possess arms or munitions. Reports from Matewan are to the effect that three deputy sheriffs accompanied by a soldier made a house-to-house canvass between Matewan and Red Jacket and collected more than 600 rifles and several pistols.

Allen H. Willett Heads Economics Bureau Of National Coal Association

ALLEN H. WILLETT has been chosen by the National Coal Association to head its Bureau of Economics. For the last two years Mr. Willett has been engaged in an investigation of wages and hours of labor in twenty-nine of the leading industries of the country. This investigation was authorized by the War Labor Board and was carried out by the Bureau of Labor Statistics of the Department of Labor. The investigation covers the entire country.

Mr. Willett is a native of Southwick, Mass. He is a graduate of Brown University and did graduate work in economics at Columbia University. From the latter institution he has a degree of Ph.D. in economics.

In 1909 he was one of the technical advisers called in to assist in preparing the schedules of the 1910 census.

Coal Consumption of Locomotives Increases Ten Million Tons in Nine Months

COAL consumed by locomotives in road transportation service only on the majority of the large steam roads from January to September, 1920, inclusive, is reported by the Interstate Commerce Commission as 81,752,821 net tons, at an average cost, including freight charges, of $3.95, compared with 71,619,009 tons, at an average cost, including freight charges, of $3.21, for the same period of 1919. The same authority gives the quantity of coal so used in September as about 9,000,000 tons, at an average cost, including freight, of $4.54, compared with approximately 8,500,000 tons in September, 1919, at an average cost, including freight, of $3.10. These statistics are given by operating regions in the following tables:

NINE MONTHS ENDED SEPTEMBER

Region	Net Tons 1920	Net Tons 1919	Cost Per Net Ton 1920	Cost Per Net Ton 1919
New England	3,621,484	3,181,602	$7.72	$5.67
Great Lakes	14,171,997	11,748,283	4.20	3.35
Ohio-Indiana-Allegheny	*19,662,888	17,185,702	3.62	2.76
Pocahontas	3,795,143	3,317,480	3.52	2.60
Southern	12,593,922	10,596,766	3.69	3.15
Northwestern	10,808,591	10,104,717	4.04	3.49
Central Western	12,870,479	11,285,472	3.38	2.97
Southwestern	4,228,317	4,198,987	4.08	3.47
All regions	81,752,821	71,619,009	3.95	3.21

MONTH OF SEPTEMBER

Region	Net Tons 1920	Net Tons 1919	Cost Per Net Ton 1920	Cost Per Net Ton 1919
New England	404,691	362,946	$8.84	$5.30
Great Lakes	1,596,524	1,377,831	5.23	3.27
Ohio-Indiana-Allegheny	2,196,915	2,089,531	4.24	2.75
Pocahontas	424,314	404,837	4.38	2.59
Southern	1,301,161	1,179,546	4.15	2.91
Northwestern	1,221,671	1,218,468	4.43	3.43
Central Western	1,457,731	1,408,570	3.57	2.85
Southwestern	441,301	473,618	4.39	3.32
All regions	9,044,308	8,515,347	4.54	3.10

Car Situation Shows Notable Improvement

A DECIDED change for the better in the car situation took place during November, according to reports just tabulated by the Car Service Division of the American Railway Association showing an increase in the number of cars available in excess of current requisitions and actual shortage confined to limited sections. The seasonal falling off in the number of cars loaded with revenue freight in November compared with October has been less than usual.

Reports received from Class 1 railroads throughout the United States show that the car supply for grain loading is generally satisfactory except at certain points in the Northwest. Practically all roads, however, have a sufficient supply of box cars for ordinary loading.

The action of the Interstate Commerce Commission in cancelling its priority orders on coal cars has made available a large amount of open-top equipment for distribution of commodities other than coal.

Foreign Markets and Export News

October Figures Show Growth of America's Overseas Coal Trade

EXPORTS of coal and coke in gross tons, as reported by the Department of Commerce for October, 1919, and the revised figures for October, 1920, are as follows:

	Oct., 1919	Oct., 1920
Bituminous, total	2,934,686	4,580,169
Exported to:		
France	.....	852,190
Italy	423,939	119,106
Netherlands	174,430	221,514
Sweden	60,734	123,694
Switzerland	69,999	189,635
Canada	1,448,605	1,994,832
Panama	5,396	10,741
Mexico	8,757	20,557
British West Indies	27,019	17,109
Cuba	115,366	115,380
Other West Indies	10,138	12,954
Argentina	95,865	268,053
Brazil	71,957	98,240
Chile	1,035	44,998
Uruguay	8,915	33,187
Other countries	412,531	457,979
Coke	81,962	103,353
Anthracite	433,742	444,391

It is significant that of the increases over the same month of last year France took 852,000 gross tons, and the Netherlands, Sweden and Switzerland all record substantial gains. Large gains are recorded also in South America, Argentina, Chile and Uruguay being conspicuous examples of the greater use of our coal.

Coal Sought for Austrian Industries

It was reported in Vienna Nov. 10, according to special correspondence that will appear in *Engineering and Mining Journal* Dec. 11, that England was trying to persuade France to release coal from the Saar district for the use of German industries. This would enable Germany to deliver large quantities of coal to Austria from the fields of Upper Silesia. Arrangements with the Polish Government are being discussed, also, with the object of furnishing from Austria the machinery and operating supplies needed by the still inactive Polish mines that the latter may increase their yield. These are the only practical methods for relieving the coal situtation in Germany, so that the latter can deliver large supplies of coal to Austria.

So far Germany has faithfully fulfilled her part in the Spa agreement, and as a result of the German coal deliveries to the Entente in recent months her own industries have had to substitute large quantities of lignite for the missing coal. Of course the full amount of this loss cannot be made up. Dispatches at hand indicate that France enjoys a superfluity of coal supply, and the coal situation in Paris is particularly favorable. Thus it would be possible at any time for France to release coal to German industries from the steadily improving deliveries from the Saar district, thereby releasing larger suppplies of Upper Silesian coal to Austria.

France's domestic coal production also is increasing, amounting to 2,400,000 tons in September as against 2,370,000 in August, which is already at the annual rate of two-thirds of the average peace-time yield. Furthermore, conditions in the wrecked mines of northern France are steadily improving. The coal output of the Saar mines by the French amounted to 702,680 tons in August, to 860,108 tons in July, and to 811,314 tons in September, 1920 (the decrease was due to the railway strikes), and is steadily rising. In January the deliveries amounted to but 727,465 tons. The Saar district needs little coal for its own industries and disposes of nearly the whole yield by sale and export monthly, so that it is clear that the present coal situation in France permits that country to dispense with the greater portion of the Saar coal. In fact several hundred thousand zentner of coal are left at the depots of the Saar district at the close of each month, which shows that France is not in urgent need of Saar coal.

The prices of Saar coal for France, Luxemburg and Switzerland have been greatly reduced since Oct. 1, 1920, another fact testifying to the favorable condition of that district and its ability to support exportations. Prices are as follows:

Kind	Today	Former Prices
Washed, lump	124 to 105 f.	136 to 115 f.
Nut, No. 1	124 to 100	136 to 110
Nut, No. 2	118 to 93	130 to 110
Unwashed lump	116 to 93	128 to 108
Run of mine	85 and 75	83
Coke, broken	150	160

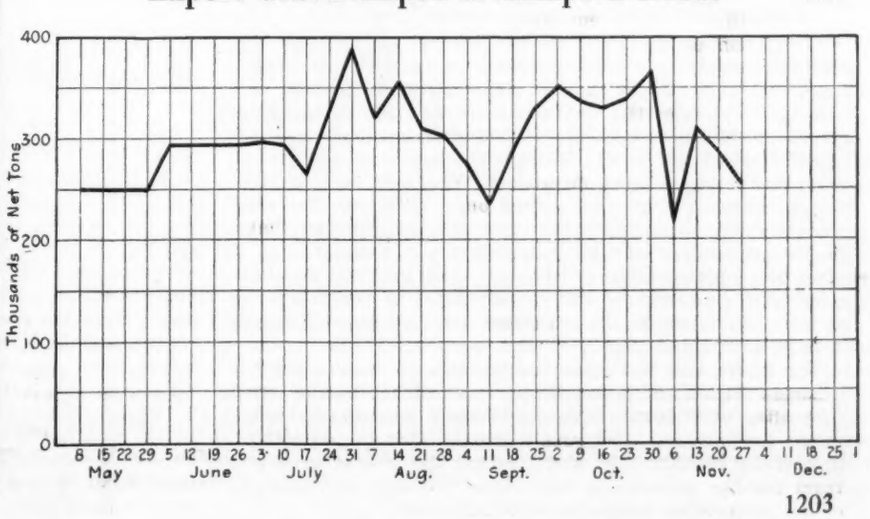
Concerning Poland, Austria could indeed aid in increasing the Polish coal yield by supplying machinery blasting supplies, whereby there also would result advantages to the Austrian supply of coal.

Export Dumpings by Ports

(NET TONS)

	Week Ended Nov. 28	Nov. 21
Philadelphia	62,000	75,000
Baltimore	69,000	159,000
Norfolk	257,000	286,000
Charleston	11,000	8,000
Total	399,000	528,000

Export Coal Dumped at Hampton Roads



Lehigh Valley Coal and Railroad Companies Ordered Dissolved by U. S. Supreme Court

THE U. S. Supreme Court on Dec. 6, 1920, ordered the dissolution of the intercorporate relations existing between the Lehigh Valley Railroad Co., the Lehigh Valley Coal Co., and the Lehigh Valley Sales Co. on the ground that the combination was in violation of the commodities clause of the Interstate Commerce Act and the Sherman Anti-Trust Act. The decision was a sweeping victory for the Government, although the bill was dismissed as affecting the New York & Middle Coal Field Railroad & Coal Co., the G. B. Markle Co., the Girard Trust Co. and the individual defendants. The court reversed the decision of the District Court for the Southern District of New York, which decided in favor of the Lehigh companies, and remanded the case with instructions to enter a degree in conformity with the opinion of the Court, which was rendered by Justice Clarke. Justices McReynolds and Brandeis did not participate in the decision, and while the Chief Justice and Justice Holmes did not dissent, the majority opinion did not represent their entire views in the matter.

Justice Clarke Reviews Company's History

The suit against the Lehigh Company was instituted by the Government in March, 1914. Justice Clarke in his opinion reviews the contentions of the Government and the history of the activities of the companies concerned.

"It is clear beyond controversy," says Justice Clarke, "that the coal company was organized and conducted as a mere agency or instrumentality of the railroad company for the purpose of avoiding the legal infirmity which it was thought might inhere in the owning of coal lands and in the conducting of coal-mining, shipping and selling operations by the railroad company, and that the policy of purchasing and leasing coal lands tributary to its lines for the purpose of controlling interstate trade and commerce in anthracite coal and of preventing and suppressing competition therein was deliberately entered upon by the railroad company, and in combination with its agency, the coal company, was consistently pursued, with increasing energy and scope after the passage of the anti-trust act until the commencement of this suit, unless these purposes and results, in point of law, were modified and cured by the organization in 1912 of the sales company and by the functions which it performed, which remain to be considered."

Reviewing the organization of the sales company the Court says: "It is too plain for discussion that with a company thus organized and officered the making of a contract by the coal company for the sale of all of its coal to the sales company was in substance and effect making a contract with itself, the terms of which it could determine in its discretion."

Contract Said to Violate Anti-Trust Act

The Court also declares that the contract between the coal and sales companies was the same as in the Lackawanna case, which the Court in that case had declared was void because it violated the anti-trust act and the commodities clause of the commerce act. "A corporation organized and circumstanced as is the sales company was neither an independent buyer nor a free agent," the opinion says. The Court contends that the purchase in form by the sales company did not so dissociate the railroad company from the transportation of coal in which it was interested as to meet the requirements of the law, and that the contract, nominally of purchase, was so calculated to restrain trade as to be obnoxious to the anti-trust act, and for this reason it is unlawful and void.

The Court also condemns the practice of the company in paying independent mines 65 per cent of the market price prevailing at Tidewater points, which it says it condemned in the Lackawanna case, on the ground that the defendants unlawfully combined by and through this 65-per cent contract for the purpose of controlling the sale at Tidewater of the independent output of anthracite coal.

"This history of almost twenty-five years casts an illuminating light upon the intent and purpose with which the combination here assailed was formed and continued," says the Court, after reviewing the activities of the companies. "It is clearly established that prior to the enactment of the anti-trust act the railroad company in combination with its coal company subsidiary deliberately entered upon a policy of making extensive purchases of anthracite land tributary to the railroad company's lines for the purpose of controlling the mining, transportation and sale of coal to be obtained therefrom and of preventing and suppressing competition, especially in the transportation and sale of such coal in interstate commerce, and that this policy was continued after the passage of the anti-trust act with increasing energy and tenacity of purpose, with the result that a practical monopoly was attained of the transportation and sale of anthracite coal derived from such lands. . . .

"Since we have also found that the contract between the coal company and the sales company was a mere device to evade the commodities clause of the Interstate Commerce Act and therefore void, it results that the decree of the District Court must be reversed and the case remanded with instructions to enter a decree, in conformity with this opinion, dissolving the combination effected through the intercorporate relations subsisting between the Lehigh Valley Railroad Co., the Lehigh Valley Coal Co., Coxe Bros. & Co., Inc., the Delaware, Susquehanna & Schuylkill Railroad Co. and the Lehigh Valley Sales Co. with such provisions for the disposition of all shares of stock, bonds or other evidences of indebtedness and of all property of any character of any one of said companies owned or in any manner controlled by any other of them as may be necessary to establish their entire independence of and from each other.

Revokes Contract of Coal and Sales Companies

"The contract of March 1, 1912, between the coal company and the sales company must be decreed to be void and all contract relations between the two companies enjoined which would serve in any manner to render the sales company not entirely free to extend its business of buying and selling coal where and from and to whom it chooses with entire freedom and independence, so that it may in effect as well as in form become an independent dealer in coal and free to act in competition, if it desires, with the defendant coal company or railroad company.

"As to the New York & Middle Coal Field Railroad & Coal Co., the G. B. Markle Co., the Girard Trust Co. and the individual defendants the bill must be dismissed."

Report of Calder Committee To Be Given To Senate This Week

DIFFERENCES of opinion on the part of members of Senator Calder's Committee on Reconstruction and Production prevented the issuance of a report on the opening day of Congress. Agreement has been reached on all sections of the report except that pertaining to coal. Senator Calder stated that on Monday a coal section would be written which he expects will meet the approval of other members of the committee. He expects to submit the report to the Senate later in the week. It is Senator Calder's intention to ask authority for the continuance of his committee, so that further hearings may be conducted.

Senator Frelinghuysen, chairman of the sub-committee of the Committee on Interstate Commerce, stated that he expects to continue his inquiry into certain phases of the coal situation, but his plans are not sufficiently mature to discuss until later.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

BUSINESS readjustment in the United States has proceeded at such a rapid pace, and the recent downward trend of prices has been so severe, the Mechanics & Metals National Bank of New York states, that there is no mistaking the distance which the country has proceeded along the path of after-war deflation. From prices early in the year, wheat before the close of November was down from $3.25 to $1.86, corn from $2.31¾ to 95c., coffee from 16¼ to 6⅝c., sugar from 23 to 8¾c., cotton from 43¾ to 16c. To a lesser extent meat and dairy products, metals and almost all wholesale commodities have participated in this decline. Security prices are severely shrunken.

Industrial and trade activity are far more curtailed than at any period since the early months of the war. With sellers of goods concerned over their inventories, with buyers holding aloof, with no confidence in the market, and with an increased rate of business mortality, factories that up to a short time ago made goods in abundant supply are closed, labor that as recently as three months ago was in demand is idle, and goods for which there was recently an unsatisfied and even urgent desire have piled up.

In contrast with the extreme optimism prevailing less than a year ago the severity of the present reaction has thrown a spirit of depression over the entire community. This has added to the momentum of the decline in prices and intensified the curtailment of business in a fashion that manifests afresh how strongly people are governed at times by their emotions rather than by their judgment. As a lack of buying helped to cause a fall in prices, the fall in prices has now caused a lack of buying.

Much of the labor absorbed by luxuries will now return to the manufacture of essentials. The efficiency of management will now increase; to overcome the handicaps of high costs of production and lower prices, improved methods of production will be introduced. The freight congestion problem, which for a time seemed insoluble, is solving itself.

Reductions in wages of 10 to 25 per cent have already been announced in many mills and factories manufacturing the goods that have most severely suffered in price. In some instances labor has taken these reductions without protest.

The determining factor in the entire credit situation, according to the *Commerce Monthly* of the National Bank of Commerce in New York, continues to be the reluctance of consumers to buy, partly because of their expectation that prices may go even lower and in part because of the curtailment of purchasing power of large sections of the buying public.

Rubber Companies Retrench

Directors of the Firestone Tire & Rubber Co., Akron, Ohio, notified common stockholders Nov. 30 that the dividend payable Dec. 30 would be at the rate of 6 per cent a year instead of 8 per cent. The directors also announced that all salaries would be reduced 10 per cent, effective at once. It was pointed out that salaries were increased 20 per cent within the last year to meet rising living costs. With living costs going down adjustment must be made in salaries, the directors said. No change was made in the wage scale now effective in the factory. The United States Rubber Company footwear division plant at Millville, Mass., posted notices Dec. 2 that it would shut down indefinitely Dec. 10, laying idle about 750 operators.

Canadian Pacific Gives Up Oil Fuel

On account of acute oil shortage the Canadian Pacific Railroad Co. is changing all its equipment, including steamships, to coal burners. It is estimated that the change will cost close to $60,000 for each steamer and $12,000 for each locomotive. The first coal-burning engine used by the road in the last five years left Vancouver, B. C., the night of Nov. 26, with a transcontinental train.

Thread Mills to Run 1 Day a Week

The four divisions of the American Thread Company in Holyoke, Mass., will go on a schedule of one day and two days a week beginning Monday, Dec. 6, it was announced Dec. 1. The company had announced Nov. 30 that beginning on Monday, Dec. 6, its mills at Willimantic, Conn., employing 2,700 operatives, would be operated only one day a week until further notice.

Rochester Shoe Factories to Reopen

Announcement was made Nov. 29 that within three weeks Rochester factories making women's shoes, now idle, would reopen at full capacity to fill orders for spring stock. The factories employ about 23,000 men and women, more than 20,000 of whom have been idle for two months.

Cedar Mill Cuts Wages 25 Per Cent

Announcement was made Nov. 29 by the Richmond Cedar Works of a reduction of 25 per cent. in the wages of the 800 men employed in its plant. The reduction is effective at once.

Ask Wage Raise; Cut Suggested

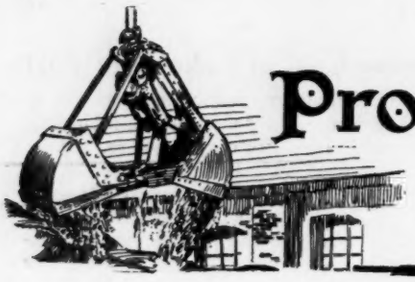
The Brockton Shoe Manufacturers' Association, responding Nov. 30 to a petition by dressers and packers for increases in wages, made a counter proposal for reductions of 10 to 30 per cent and asked that the matter be the subject of arbitration; 900 operatives are affected.

Cotton Mills Open and Close

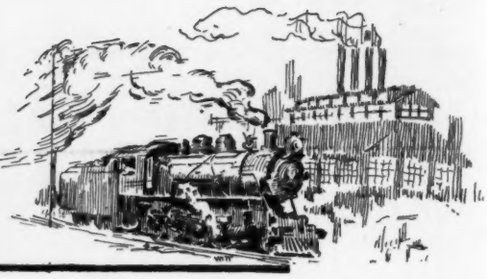
After standing idle for two weeks, cotton mills, including the Loray, the largest in Gastonia, N. C., and the Armstrong chain of fourteen factories, resumed operation Nov. 29 on greatly reduced schedules of working time. In Lowell, Mass., notices were posted Nov. 27 that cotton mills employing upward of 20,000 would run half time beginning Nov. 29.

Phonograph Plants Reduce Forces

The plant at Dubuque, Iowa, of the Brunswick-Balke-Collender Co., employing 500 men, closed Dec. 1 for an indefinite period. On the same date there was a layoff at the Edison factories in West Orange and Silver Lake, N. J., the idle now numbering 1,200.



Production and the Market



Weekly Review

SETTLING down to a game of waiting, the soft-coal trade, both sellers and buyers, are marking time until the situation crystallizes. About the only field in which car supply was not approximately adequate to meet the demands of the market was in West Virginia on the C. & O., although in eastern Ohio mines served by the B. & O. reported losses on this account. Spot-coal buying except at low figures has almost stopped and contracts are now being filled at a rapid rate.

Anthracite More Plentiful in the East

Prices are still moving down, with business for next year being quoted below present spot prices. The rush to cover is not so general or widespread as would appear from a consideration of current reports, because many important factors are holding back in the confident belief that the market will turn again before every demand is satisfied, but the fact that this movement to contract for next year has developed so early is strong evidence of a lack of confidence in the future. Exporters are digging deep for new business and shipping on contracts as heavily as foreign buyers will take coal.

Along the Atlantic seaboard the supply of bituminous and anthracite coal is better than a week ago, with outright cancellations and "hold-up" orders featuring the New England and New York situations. The Chicago market is well supplied with domestic sizes of bituminous coal, both local and from Eastern fields.

Railroad buying is negligible and contract receipts are being curtailed. In the Bellville district of Illinois the railroad mines are operating full time and some spot purchases for fuel have been made at approximately the old Government price of two years ago.

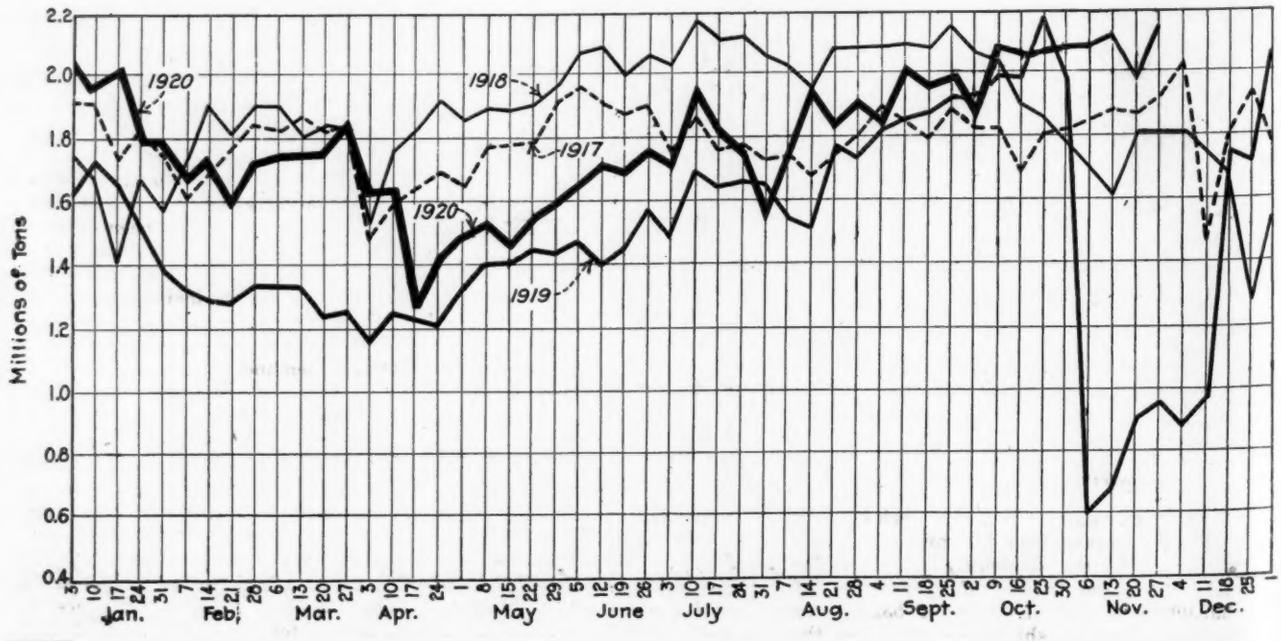
Action by Congress to bridle the coal industry is not seriously considered as a possibility because so far the active proponent of this doctrine, Senator Calder, has developed no angle to this many sided question that is not already pretty well known and discounted by the public.

Meanwhile the mild weather and good production of hard coal—the rate is now nearly 2,000,000 tons per week—have eased the market for the scalper and by the time this is read it is predicted independent coal will be quoted no higher than $9@$9.50 at the mines.

Bituminous

While total production during Thanksgiving week declined, the rate per working day increased. According to the Geological Survey, the output was 11,416,000 net tons, the largest in any Thanksgiving week of the last four years. Considering the holiday as about one-fifth of a normal working day, the average daily production was 2,174,000 tons, as high a rate as has been attained this year. Heavy pro-

Daily Average Production of Bituminous Coal*



*From weekly report of Geological Survey.

Lake Coal Dumped Season to Dec. 4

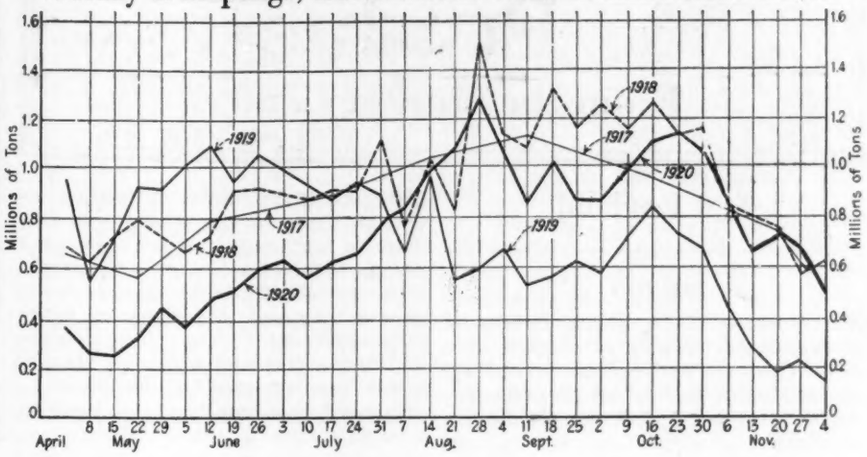
(NET TONS)

	1919	1920
Total	22,889,717	23,431,330

Week of Dec. 4, 1920

Cargo	454,605
Fuel	19,310
Total	473,915

Weekly Dumpings, Bituminous Coal at Lake Erie Ports



duction on Monday and Tuesday (Nov. 29 and 30) is reported, with loadings of 85,349 cars of bituminous coal, compared with 84,956 cars the same days the week previous.

Losses attributed to labor are steadily declining. Labor shortages are disappearing in a gratifying manner and the men are working as if they meant it. The general release of labor from other industries, caused by the business depression, has produced a wholesome effect on the efficiency of mine labor, reflected in steadily increasing production in the strike areas of Alabama and West Virginia. The arrival of Federal troops in Mingo County, West Virginia, had an immediate stabilizing influence in that locality, and the military forces have apparently checked the depredations and intimidating acts of the strikers. District 17, U. M. W., has already sounded Governor Cornwell of West Virginia on the subject of intervention with a view of bringing about a conference with the operators, who are standing firm on their refusal to recognize the union in any manner.

Betterment in car supply was general throughout the country with the exception of Eastern Ohio mines served by the B. & O. and West Virginia operations on the C. & O.

Mild Weather Lowers Domestic Prices

The effect of the general business depression has been to again accentuate the decline in steam coal prices. Domestic coal also is lower, owing to the mild weather which has prevailed and the fact that many operators have turned to prepared sizes since the slump in the steam market. Many small operations have felt the effect of these price recessions and not a few have been forced to close down, as it was impossible to adhere to their higher wages on present coal prices.

The following table shows the trend in the spot steam market (mine run basis, net tons f.o.b. mines):

	Nov. 1919*	May 1920	Aug. 5 1920	Nov. 25 1920	Dec. 2 1920	Dec. 9 1920†
Pittsburgh steam	$2.30	$4.00	$10.00	$5.00	$5.00	$4.00
Pittsburgh screened gas	2.30	4.50	12.00	5.75	5.50	4.75
Hocking	2.50	4.75	9.00	4.50	4.50	4.25
Franklin, Ill.	2.35	3.75	6.50	5.00	5.00	5.00
Indiana 4th vein	2.35	3.40	7.50	4.25	4.00	4.00
Eastern Ohio, No. 8	2.35	4.50	10.50	5.00	5.00	4.50
Fairmont	2.50	6.75	13.50	4.75	4.75	4.25
Kanawha	2.60	6.75	14.00	4.75	4.75	4.50
S. E. Kentucky	3.00	6.00	10.50	5.00	5.25	5.25
Western Kentucky	2.35	3.50	5.25	4.25	4.25	4.25
Clearfield	2.95	6.25	12.00	5.00	5.00	4.75
Cambria and Somerset	2.95	6.75	13.50	6.00	6.00	6.00
New River / Pocahontas	2.70 / 2.35	6.50	14.00	5.00	5.25	5.25

*Government prices.

†Advance over the previous week shown in **heavy type**, declines in *italics*.

Tidewater dumpings in the week of Nov. 27 were 1,034,000 tons, a decrease from the preceding week of 107,000 tons, according to the Geological Survey. The decline was due largely to the falling off of exports, which amounted to 399,000 net tons, as against 532,000 tons for the week before. Foreign shipments were less than 60 per cent of those during the record week of Oct. 17, when exports were at the rate of over 2,900,000 tons per month.

As shown in the following table, shipments to New England increased slightly to 178,000 net tons:

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Totals
Coastwise to New England	61,000	16,000	.....	101,000	.....	178,000
Exports	.....	62,000	69,000	257,000	11,000	399,000
Bunker	97,000	13,000	14,000	63,000	.....	187,000
Inside capes	.....	49,000	23,000	4,000	.....	76,000
Other tonnage	155,000	3,000	.....	35,000	1,000	194,000
Totals	313,000	143,000	106,000	460,000	12,000	1,034,000

Shipments to New England via all-rail recovered during the week, showing an increase of 236 cars over the preceding week. The report for the week of Nov. 27 was 4,705 cars through the five rail gateways.

Lake coal dumped during the week ended Dec. 4 amounted to 473,915 net tons, as compared with 142,994 tons for the corresponding week of 1919. Shipments to the Lake ports have practically ceased and the cumulative movement for the year amounts to 23,431,330 tons, as compared with 22,889,717 tons for last year.

ANTHRACITE

Production of hard coal during the week ended Nov. 27 is reported by the Geological Survey as 1,692,000 net tons, a decrease of 283,000 tons from the previous week, attributed to the general observance of Thanksgiving Day. Recovery in output after the holiday was prompt.

Shortage of Fuel in East Remedied

With the practical cessation of Lake shipments of hard coal a large tonnage has been diverted to Eastern centers and the long-discussed shortage has been speedily remedied. Hard coal is now flowing to Baltimore, Philadelphia and New York, while New England is practically over the shortage panic. This diversion is causing some uneasiness in the Middle-West, where receipts have been reduced correspondingly. Independent quotations in New York range $10@$11 on domestic sizes, a sharp decline from last week, while Philadelphia reports a radical increase of $1.50@$1.80 on this product. At this writing no announcement has been made as a result of the conference of operators and miners concerning the latter's demand for adjustment of wage inequalities.

COKE

Beehive coke production increased slightly. Gains were recorded in all districts but Virginia and Kentucky. The Geological Survey places the output at 368,000 net tons, or 3,000 tons more than that of the preceding week.

Prices for spot coke are again falling, reflecting the greatly weakened demand. Furnace quotations are $7.25@$7.50; foundry, $8.50@$9. Operators and furnace men are negotiating on contracts for the first half of 1921, but neither side is showing any haste, because of the extreme uncertainty of the market.

Reports From the Market Centers

New England

BOSTON

Mixed Situation on Steam Grades — Railroads Are Quietly in Market—Receipts Continue To Diminish—Hampton Roads Market Is Dull—Anthracite Demand Sustained, but Easier Conditions in Sight.

Bituminous—While there is almost an utter lack of request for inferior grades both from West Virginia and Pennsylvania it is apparent that there is now something more than a straggling demand for the low ash, low volatiles. There is no new life to industry that would have any such result but there are utilities here and there that have not been getting their contract quotas, due to irregular car-supply and that in part accounts for the somewhat better inquiry. It is unlikely this is anything more than a temporary demand, however, and another week or so will doubtless see the market back in the doldrums.

Certain of the railroads are again seizing coal in considerable volume. While the roads here are in comfortable shape as to supply it is New England's coal largely that is being confiscated and it has been quietly intimated to large shippers that carriers are in the market for shipments during the next 30 days. Little is heard as to prices, but on much of the high-grade coal seized the invoice price is considerably up from the level at which railroad buyers would probably be able to cover in a considerable tonnage.

There is a steady falling off in receipts both by water and all-rail. Most manufacturers have coal on hand for 90 days easily. For the textiles in most lines there is practically no business. Shop-keepers have very little stocks of cloths and knitted goods, but there is no buying or incentive to manufacture. The paper mills are fast getting into the same class with rubber manufacturers and the metal trades and there have been several requests to coal shippers the past week to withhold deliveries.

At Tidewater piers in New York and Philadelphia there is only a relatively small volume of coal on hand. Bunker trade is fairly stable, although prices are fluctuating. Export demand is becoming increasingly erratic, and the more prudent shippers are not sending coal to the piers except on actual orders. Even through the Tidewater Coal Exchange demurrage charges have been heavy.

For Pocahontas and New River there is only an indifferent market. Contracts coastwise are absorbing regular tonnage, but the volume of these underwritten early in the season was less than in any other recent year and several agencies who were in the export trade up to their necks are now being hard put to move the output of mines they represent. Prices have sagged still further the past week, less than $8 having been rumored f.o.b. vessel.

Current quotations on bituminous at wholesale range about as follows:

	Clearfield	Cambrias and Somersets
F.o.b. mines, per net tons	$4.00@5.25	$5.00@ 6.50
F.o.b. Philadelphia, per gross ton	7.25@8.50	8.25@10.00
F.o.b. New York, per gross ton	7.70@9.25	8.70@10.50

F.o.b. Providence and Boston Pocahontas and New River are selling down to $11.50, with a very restricted market.

Anthracite—There is no let-up in demand for domestic sizes. Retailers are still besieged for prompt deliveries. Prolonged mild weather is having its effect, however, for there are many signs that hard coal will be in much easier position within a few weeks. Orders are being gradually filled, and while in the large cities there are insistent needs from day to day that must be met, it is beginning to be apparent that we are already through the worst phase.

The Boston newspapers on Dec. 2 printed the names of wholesalers here who have charged more than $9.50 per gross ton f.o.b. mines, the names having been furnished by the State Fuel Administrator. Quotations are being freely made up to $14 for spot shipment, although several shippers have named $12 as their upset price.

Tidewater

NEW YORK

Anthracite Conditions Improve with Increased Receipts — Demand Continues Strong — Independent Prices Drop — Bituminous Prices Are Lower—Cancellations Increase — Demand Falls Off Because of Business Depression.

Anthracite — Increasing production and a decrease in shipments to the West have resulted in more coal finding its way into this market. The situation is easier and the shortage which existed a few weeks back is considerably modified. Nevertheless, the market is ready to absorb a large tonnage before conditions become normal.

There are comparatively small stocks on most retail yards and some do not boast of much except buckwheat or smaller sizes. All of the larger coals are scarce and consumers are willing to take any size.

Buyers are not so willing to take high-priced coal as they were a few weeks ago. Weather conditions have not caused a heavy consumption and with the steady mining increased tonnages have resulted in easier prices.

With the passing of this month demand will simmer down to actual necessities here as this market becomes a weather market. Neither dealers nor consumers will want to keep their bins filled, preferring to take chances with lower prices for both company and independent coal on April 1.

Line trade is active. Heavy shipments are being made into New England which states salesmen say are better supplied than is generally believed. Dealers in the surrounding towns, particularly those on Long Island, are being given considerable attention while transportation is favorable.

Instead of hearing quotations of $13@$14.50 for the independent domestic coals, present quotations range $10@$12.

Steam coals are piling up. Consumption has not been heavy and dealers doing a heavy business with office buildings have large stocks on hand. There are many boats loaded with rice and the smaller sizes. Barley is the most prominent size. Independent prices are: Buckwheat, $4.25@$5.25; rice, $2.75@$3.50, and barley, $1@$1.50.

Bituminous—A drop in demand due to decreased consumption while production is going on at a steady pace, caused a further decline in prices. Spot coals are obtainable in larger quantities and shippers believe that they will steadily increase.

A bright spot in the situation is pointed out by some shippers, who compare present bituminous prices with those for which the better grades of anthracite steam can be obtained. Users of bituminous are obtaining better results and more heat than are the users of the small anthracite coals, and they believe that when this becomes generally known there will be an increased demand for the soft coals.

Requests, practically amounting to cancellations, that shippers hold up deliveries of coal are being daily received by operators. Instead of requests for coal, salesmen now find it necessary to go among the trade.

Operators are not having much trouble in keeping help nowadays while work is slow, but a brisk demand causes many of the miners to go into the woods for game. Reports from the Clearfield regions show that upward of 11,000 hunters' licenses have been issued this winter.

Quotations for the various pools show a wide range of prices: Pool 11 along the B. & O. is around $3.75, and up to $4.25 on other roads. Pool 34 is easy with quotations ranging $4.25 along the B. & O. and $4.50 on the Pennsylvania. Pool 10 ranged $4.75@$5.75 and Pool 14, $4@$4.40. It was reported that certain Canadian railroads were purchasing coals from mines along the New

York Central at $4.40. Quotations for Bessemer, an unclassified coal, was around $5.

There are many loaded boats about, some of which contain Pool 34 coal. Prices at the piers range $8@$9.50, with loaded boats in proportion, a stray cargo of Pool 4 being quoted at $8.50.

PHILADELPHIA

Anthracite Shipments Improve — Consumer Demand Still Strong — Steam Trade Eases Off — Bituminous Prices Still Shade Downward — Best Coals Freely Offered on Market — Contract Quotations Heard — Export Business Drifting Into Old Hands.

Anthracite—The improved condition as to shipments continues, although there is not the rush of coal that some had expected. Dealers in the city and vicinity, particularly those buying from the large companies, are getting fair receipts of all sizes. Consumer demand continues strong, but an inspection of the yards discloses the fact that the turn of the Eastern market has come at last. Dealers are wondering just how much more coal local buyers can absorb, for, with most moderate weather prevailing, they know that an unusual tonnage still remains in the cellars.

The recent turn in the wage discussion, where Washington decided that the problem of increased wages could be reopened, has caused much talk among the trade. There is a feeling that should the miners force an increase the operators might pass it up to the retailers with a sort of implied understanding that no increase in retail prices would be made. The more reasonable suggestion heard is that the big operators, at least, would absorb half the increase, adding the other half to the wholesale cost, and with the present gross margin of $4 and over in the retail trade the dealers might be able to do their share in holding down the price.

One of the biggest surprises recently experienced by the trade is a report that some of the independent shippers have radically increased their prices. These increases run as much as $1@$1.50 on pea and $1.50@$1.80 on prepared sizes. While we have seen no printed circulars, yet we have heard it quoted on reliable authority that this is the case. It was quite difficult at first to credit the report, but at this time there seems to be little doubt of its authenticity. At first it was thought that the operators, contemplating another increase to the miners, were thus taking advantage of the first of the month to adjust their schedules. Another reason advanced is that some independents actually have been selling at these figures and are now publishing the prices as a matter of record. The latter appears the more likely of the two.

Due to unabated easing off of bituminous prices, the independent steam figures are creeping close to company prices and independents are finding it difficult to get as much as twenty-five or fifty cents over the $4.25 buckwheat price.

Bituminous—The market has experienced another downward movement, with an extremely light demand. The very best coals are coming in greater volume, with Pool 9 offered at $5.50. Pool 10 is being sold for $5.25 and Pool 11 about $4.50. There is considerable unclassified coal being offered $3.75@$4 and this practically covers Pool 18. Pittsburgh gas coal Pool 61 quotations recently heard were $5.25 for screened, $4.75 for mine run and $4.25 for slack.

The railroads have become particular as to the acceptance of fuel. They seem to have adopted a higher standard of inspection, at any rate there is much refused coal standing around on this account.

One of the big producing companies is quietly renewing agreements with old customers which expire on Jan. 1, at practically the old figures. In one or two instances we have heard that the price is $4.30 and it looks as though this would be the ruling price on the high grade coals. Despite this report of a contract fixture it is certain that little tonnage has as yet been agreed upon by other shippers, as there is still a disposition to wait.

The export trade is still quiet. Although the railroads still have an embargo on the piers it is merely nominal, as a shipper with a boat at hand can get a permit if he has the coal enroute. Newcomers in the export trade have about retired and the business has revolved itself into the hands of the "old reliables," with well-established connections both here and abroad.

BALTIMORE

Fluctuation in Soft-Coal Market With Renewal of Car Shortage Apparent—Export Movement Falling Off Rapidly —Hard Coal Receipts Continue Good.

Bituminous—Rapid changes are taking place in the soft-coal market, and each day is setting its own levels. At times excellent coals have been offered here at a mine basis of $5 or little better; again the same grade coals are held firmly at $6. What applies to best coals also applies to the balance of the list, and sales have been made recently all over the range between $4@$6.25.

The one consistent thing is the rather poor demand for coal. The question of supply seems for the moment to be the regulating feature of the changing market. Recently the car run was much improved and hung in the 80@90 per cent class on many days. For the past few days, however, there has been a recession, and at this writing it is around 59 per cent on B. & O. lines East and 63 per cent on lines West. The Pennsylvania run is reported about the same ratio, with the Western Maryland Ry. better, but by no means perfect.

Daily loadings on the B. & O. are now quite often below the 3,000-car mark, while reserve at the pool on some days drops below 1,000 cars at all piers. Daily dumpings are falling, as the number of waiting ships for coastwise and export coal steadily decreases. At this writing, less than ten boats are at the piers or waiting astream for coal cargoes, and to take on only about 30,000 tons of coal.

The fall of exports began with November. In that month a total of 90 ships loaded export coal here. They carried 499,442 tons of cargo and 36,734 tons of bunker coal. In October 118 ships had sailed, with a total of 653,762 tons of cargo and 39,567 tons of bunker, the best record for a month ever made at this port. The drop in December loadings has been great and a poor showing will be made, even as compared with November.

Anthracite—Hard coal continues to come in with a fairly free run. Mild weather has continued so far and this is still aiding in holding down consumption while the emergency deliveries are made. The trade is working along the lines of best distribution as to shortages so far, instead of sticking to old customers.

Many coal accounts are being switched, and this of course at times creates feeling. It seems, however, to be a natural evolution of the conditions under which the business is being conducted.

Lake

BUFFALO

Bituminous Prices About at Bottom—No Prospect of Improvement Right Away—Cars Are Plentiful—Anthracite Situation Is Better—Lakes Closing.

Bituminous—Consumers are out of the market generally for they are getting about all the coal they want from their April contracts. Operators are out for larger sales, in fact doing all the walking, but mostly to no purpose. Consumers do not care to stock up on a falling market. The decline in prices is still on but is slow.

It mostly depends on the miners now as to how far prices will go down. If they can hold their wages up the decline will have to stop soon. Even now certain mines that did not pay very big wages have reached their limit and will have to shut down soon if wages remain where they are. Mines with a good amount of low-priced contracts are coming into their own now. They see the producers that secured high prices up against high wages with no more premium orders to pay these wages.

The indifference of the consumers to the market keeps it weak. Consumption is light and the car supply is so good that coal sellers are not able to urge buying on the score of low deliveries. Add to this the immense reduction of consumption from mild weather and the situation has played entirely into the hands of the consumers.

Bituminous prices are weak at $5 for Pittsburgh and No. 8 lump, $4.25

for mine run and slack, $4.50@$4.75 for Allegheny Valley mine run, $6@$6.50 for Youghiogheny gas, and $6.50 up for smithing and smokeless, both very scarce.

Anthracite—The worst is over in the hard coal trade. The mild weather has continued so that but a light fire has been needed and shippers claim that there were a good many consumers begging for coal who already had at least a partial supply.

Lake trade is now practically at an end, so that in a week the supply locally ought to be large enough to meet all demands. It was the strike or vacation that upset all calculations. When that happened all efforts to make up deficiencies, either here, up the Lakes or in Canada had to be given up. For this reason the independent operators are able to get premiums, all the way up to $6 a ton occasionally, although most jobbers refuse to handle coal at such prices.

Coke—The demand is light for factory use as furnaces are not running strong, prices remaining weak at about former figures, $9 for 72-hour foundry, $8.50 for 48-hour furnace and $7.50 for off-grades and stock. Domestic demand is much more active as consumers are still buying in competition with anthracite. Prices range $6.50 for furnace sizes, $10.50 for stove and chestnut and $2.75 for breeze.

MINNEAPOLIS

All-Rail Market Declines—Unseasonable Weather Aids Dock Situation—Transportation Condition Improves.

The season of Lake navigation is officially closed and the docks on Lake Superior have all the Eastern bituminous that will be available. The dock figures on hard coal show a slight shortage only, as compared with a year ago, but the mild fall has offset it and the net stocks are very likely to serve well into the close of the winter.

But on soft coal the docks are undeniably short, even after all allowances for mild weather, diversion to Illinois fields and any other possible deductions. An unknown factor is the probable industrial consumption. At present this is running lower than a year ago, due to mild weather and reduced production. The downward tendency of prices has reduced buying considerably.

The all-rail situation is very easy. Lower grades of Illinois coal are off from the high point as much as $3 a ton. Screenings are at a discount. Better grades of steam are off $1.50@$2 and domestic is lower by at least $1. Operators are ready to take contracts for January delivery.

The market promises to be very easy as long as mild weather continues. On the other hand, if severe weather should set in the market would rebound sharply.

Reduced prices are due to the lower demand and heavy production, with improved car movements. That traffic has cleaned up under limited tonnage does not establish that it would hold up if the normal volume of merchandise freight were moving. Railroad men declare that they will be able to maintain present conditions, but many shippers have that Missourianic cast of thought that intensely desires to be shown.

Despite the promising situation there are many coal men who feel that the Eastern mining companies having affiliated dock companies have not lived up to their implied obligations to Northwest consumers.

In serving the Northwest the docks have implied a continuous service through the winter, which their customers had a right to accept as a recognized obligation. Hence to the extent that they have diverted a portion of their usual tonnage to other customers, and have left their affiliated concerns with a curtailed supply, by so much have they failed to live up to the implied obligation which they have accepted in other years. Instead of profiteering because of the temporary emergency it is argued they should have had their usual stock to sell at the going market, which is made up of the usual profit and the various transportation and labor costs attendant upon delivering it to the docks.

CLEVELAND

Domestic Fuel Receipts Improve—Lake Season Winding Up — Retail Prices Show Little Change—Steam Coal Shaded.

Bituminous—Closing of the Lake navigation season Dec. 1 brings the assurance of an ample supply of soft coal for domestic consumers in this district. Although Lake shipments have been dwindling for some time improvement in receipts for use in this locality thus far has been comparatively small, but a more rapid increase may well be expected during the next few weeks.

Retail prices have remained practically unchanged for a little more than two weeks. Prices at eastern Ohio mines for spot bituminous now range $5@$6.50. Steam prices have been shaded in a few cases, due to a decline in the demand on the part of industrial plants which are curtailing operations or closing down. Somewhat lower prices are expected for steam coal within a short time.

The recent mild weather has greatly aided retailers in making deliveries and most concerns have been making good progress in catching up on orders. Unless cold weather comes unexpectedly the majority of dealers will soon be in good shape.

Retail prices of coal per net ton delivered in Cleveland are:

Anthracite—Egg, chestnut and stove, $15.10.
Pocahontas — Shoveled lump, $11.75; mine run, $11.10.
Domestic Bituminous — West Virginia splint, $11.75; No. 8 Pittsburgh, $9.65; cannel lump, $15.
Steam Coal—No. 6 and No. 8 slack, $9.50; No. 6 and No. 8 mine run, $9.65; No. 8 3-in. lump, $9.65.

Anthracite and Pocahontas — All grades of anthracite coal are still very scarce with little probability of a much greater supply for some time to come. Prospects of colder weather continue to add to the orders on books of dealers and to keep deliveries in arrears. Only about nine cars of anthracite a day are being received.

Lake regular vessel insurance for Great Lakes traffic has expired but a few boats are still expected to take cargoes by the payment of a higher insurance rate. Probably not more than a half dozen carriers will be required, however, to clean up the remaining supplies on the docks, represented by shipments which were slow to arrive from the mines.

MILWAUKEE

Demand Is Light Because of Mild Weather and Lessened Industrial Consumption—Buckwheat Very Scarce—No Change in Prices.

The market is dull and stocks are not moving as fast as is desired. Mild weather and industrial depression both contribute to this. Anthracite and screened Pocahontas are not so plentiful as to be affected in price, but soft coal is not as stable. A material decline at the mines would unquestionably affect prices in this district.

Much of the coal now on the docks was bought at stiff prices, hence the nervousness of receiving companies and their aversion to piling up stocks. Buckwheat anthracite is extremely scarce. Coal is still coming by Lake. Fourteen cargoes are now on the way and if mild weather continues coal will be received close up to Christmas.

November receipts by Lake, not including carferry, total 103,823 tons of anthracite and 335,955 tons of soft coal. This season's receipts to Dec. 1 foot up 805,186 tons of anthracite and 2,257,872 tons of soft coal, against 892,526 tons of the former and 3,053,733 tons of the latter during the same period last year.

Four coal companies which were penalized for inferior coal delivered on city contracts last spring had their money refunded following representation that the coal furnished was the best they could obtain at the time.

Inland West

CHICAGO

Local Market Is Swamped with Smokeless—Railroad Orders Are Curtailed—Indiana and Illinois Grades Are Firm, but Demand Greatly Weakened.

During these days of industrial depression and unseasonably warm weather, it is considered a fairly difficult feat to sell a car of either domestic or steam coal at a decent price. Buyers of all coals are feeling so languid in regard to fuel that it takes quite an inducement to make a sale. While conditions are far from ideal it ought, however, to be said that there is some improvement in the market over last week.

The Chicago coal trade is beginning to wonder what has happened to the export business, so long enjoyed by West Virginia operators. The local market is, apparently, swamped with Pocahontas and New River coals.

Those operators in West Virginia who have contracts at $4.25@$4.90 f.o.b. mines for mine run are shipping on these contracts on a one hundred per cent basis. In addition, many operators are forwarding their smokeless coals to Chicago wholesalers and allowing them to sell the coal at the best prices obtainable. On account of this situation, it is now possible to buy the best grades of Pocahontas or New River mine-run on the basis of $5@$6 per ton f.o.b. mines. It is noticeable that but very little Pocahontas or New River prepared coal is coming in, as practically the entire tonnage consists of mine-run.

The various railroads with headquarters in Chicago, who have been buying coal almost daily on the open market have now reached the point where they are able to discontinue this practice. Not only have they stopped buying at current prices but they have instructed the operators who have contracts with them to curtail shipments anywhere from twenty-five to fifty per cent. Taking into consideration that the mines have plenty of cars now, it means that all this extra coal is thrown on the market and must be moved. While prices are very much lower indeed than they were four, or even two weeks ago, it is not expected by those in close touch with the trade, that prices will go to lower levels this winter.

Current prices, f.o.b. mines, quoted from day to day on the open market are as follows:

Souther Illinois (Franklin, Saline and Williamson Counties):	
Prepared sizes	$5.25@$6.50
Mine run	4.50@ 5.25
Screenings	3.50@ 4.15
Central Illinois (Springfield District):	
Prepared sizes	$4.75@$6.25
Mine run	3.25@ 4.00
Screenings	2.75@ 3.25
Northern Illinois:	
Prepared sizes	$5.00@$6.00
Mine run	3.75@ 4.50
Screenings (washed)	4.00@ 4.50

Indiana (Clinton and Linton, Fourth Vein):	State	Outside State
Prepared sizes	$3.45	$4.75@$6.00
Mine run	3.20	3.75@ 4.25
Screenings	3.00	3.00@ 3.50

Indiana (Knox County, Fifth Vein Districts):	State	Outside State
Prepared sizes	$3.25	$4.25@$6.00
Mine run	3.00	3.25@ 3.75
Screenings	2.80	2.75@ 3.25

ST. LOUIS

Market Declines on All Grades—Steam Sizes Are Becoming a Drug—Railroads Buying at Low Figures—Carterville Operators Hampered by Poor Motive Power.

Mild weather, with the business depression is the cause of a continued decline in the coal market. Locally there is absolutely no domestic call and retail business is almost at a standstill. In steam it is almost as bad. Standard screenings are down to $2.75 with no demand. Country prices range 35@50c. higher in isolated cases only. Standard 2-in. lump is as low as $3.75 and 6-in., $4.75. Mine run is reported being sold to railroads as low as $2.35.

Car supply in the Standard field is good, with working time about three to four days, and five to six days at mines where railroad coal is being loaded exclusively.

There are no changes in prices or conditions in the Mt. Olive field. There has been a noticeable slowing up in the Carterville field of all grades, but sufficient orders are on hand to take care of all production for the present.

A few mines are having trouble moving steam sizes, especially screenings. Conditions other than that are satisfactory at all places excepting on the Missouri Pacific, where nine engines out of ten on the Coal Belt were taken out of service on account of bad order. Water shortage is causing some mines to shut down.

Carterville prices show a decline. Screenings are as low as $3.25, mine run, $3.50 and the top of the independent market on lump and egg shows $5, with the regular circular prices of $4 @$5 prevailing.

No anthracite is moving into St. Louis and there is no demand for smokeless.

DETROIT

Steam Prices Touch Still Lower Levels—Domestic Situation Is Easier—Bituminous Receipts Improve—Anthracite Supply Is Inadequate.

Bituminous—Neither steam nor domestic bituminous is at present in strong demand locally. Consumption in both divisions is being greatly curtailed.

Buyers of steam coal are in most instances confining their purchases to quantities required for only a few days ahead and are manifesting some indifference in the matter of increasing or building up reserves. This condition is attributed largely to the general state of business in industrial lines. Manufacturers do not feel that developments have yet reached a point where they can definitely make commitments. Under present conditions they are unwilling to have large amounts of working capital tied up in coal or inventories. Another factor tending to delay buying is the opinion that further reductions will be made in coal prices and that by waiting the consumer will be in a stronger competitive position.

Weather conditions have brought about a weakening in the domestic sizes. Pressure on retail dealers has eased off and is reflected in a less active inquiry coming to jobbers and wholesalers.

Bituminous shipments are making some gain in volume, although the quantity received does not appear to be excessive. Jobbers say little free coal is to be found around town. The supply of domestic is less plentiful than the steam sizes and in some instances domestic buyers have found it desirable to accept the latter.

Hocking lump is quoted $7 at the mines. Mine run is offered at $5 and slack $3.75@$4. For West Virginia lump $8 is asked, with mine run $5.50 and slack $4.50@$4.75.

Anthracite—Inadequacy of the supply is becoming more apparent, despite the present dropping off in demand from consumers. The retail dealers have no reserve stocks and most of them can offer no assurance of being able to fill orders promptly.

CINCINNATI

City Receipts Are Adequate—Retail Prices Unchanged—Anthracite Stocks Are Low—All Demands Are Fair.

Consumers in this vicinity are better able to withstand any shortage than other cities outside of the district. Sufficient coal is being received daily through river shipments to tide over the railroad coal car shortage, and while there is still a very strong demand for all grades, which cannot be fully met, the supply is adequate for almost normal operations.

Very little change is noted in general market conditions. Anthracite coal still is strongly in demand, but a very small supply is being received. Wholesalers say the outlook for improvement in the movement and supply of this grade is not very promising.

Because of the coal car tie-up operations at the mines are far below normal, the output being only in accordance with actual needs on the various contracts. Coal being shipped by way of the Ohio River is disposed of with but little trouble to both steam and domestic consumers in Cincinnati.

No change is noted in the retail prices, which are quoted as follows:

Bituminous lump	$9.25@$10.50
Nut and slack	8.50
Run of mine	8.75@ 9.25
Smokeless lump	11.25@ 11.50
Run of mine	10.00@ 10.50
Anthracite chestnut	15.00@ 16.25
Coke, domestic egg	16.00

COLUMBUS

Prices Are Still Breaking on All Grades—Lake Season Is Practically Ended—Better Car Supply in All Fields—Domestic Supply Is Good.

The feature of the trade is the break in prices all along the line. The extreme high prices are now a thing of the past and quotations are more reasonable in every way. While domestic sizes are still strong, prices have declined to a large extent on lump and egg. Mine run and screenings are lower than has been the case for more than a year. The tendency is still downward.

Domestic demand is still one of the best features of the trade. Retailers are buying actively as their trade is absorbing a large tonnage. In Columbus there is no shortage of domestic sizes and the same is true in many other sections. Some of the smaller villages and agricultural sections are still short of coal but no actual suffering has been reported. With the weather continuing rather mild, dealers have had no opportunity to catch up on orders.

Retail prices have declined in sympathy with those at the mines. Hocking lump retails $8.50@$9; mine run, $8@$8.50. West Virginia grades sell $9.50@$10 for lump with Kentucky coals about the same. Little Pocahontas is yet available.

The steam trade is quiet and buying is at a minimum. Steam users have succeeded in accumulating some surplus stocks and are not in the market, especially in view of many industrial contractions. Public utilities are supplied and the same is true of hospitals, schools and public institutions.

Lake trade is still progressing, although loading for the lower ports has stopped. Actual shipments are still going on for it will require some time for coal to be moved from the mines to the Lake. Vessels are still available and traffic is not disturbed by storms.

The H. V. Docks at Toledo during the week ended Nov. 27 loaded 99,543 tons as compared with 144,943 tons the previous week, making a total of 3,886,503 tons for the season. During the same week the T. & O. C. docks loaded 25,449 tons, as compared with 35,420 tons the previous week, making a total of 1,743,984 tons for the season.

Production has been gradually increasing under better car supply and labor conditions. Car supply on many of the roads is close to 100 per cent. Eastern Ohio is still somewhat short of cars and the same is true of the mines in the Kanawha & Michigan.

The Southern Ohio field for the week ended Nov. 20 produced 315,794 tons out of a capacity of 614,448 tons. Of the shortage of 298,645 tons, 110,516 was due to car shortage; 102,881 to labor shortage; 445 tons to a strike; 32,911 tons to mine disability and 51,901 tons to other causes.

Prices at the mines of the principal coals used in central Ohio are

Hocking lump	$4 00@$5.75
Hocking mine run	3 75@ 4.75
Hocking screenings	3 50@ 4.50
Pomeroy lump	4 50@ 6.00
Pomeroy mine run	4 00@ 4.75
Pomeroy screenings	3 50@ 4.50
West Virginia Splints, lump	5 00@ 6.50
West Virginia Splints, mine run	4 50@ 5.50
West Virginia Splints, screenings	4 00@ 5.00
Pocahontas, lump	6 00@ 6.50
Kentucky, lump	4.75@ 5.75

South

LOUISVILLE

No Demand for Steam Coal—Prepared Sizes in Good Call—Fight Is Launched on Poor Transportation Conditions.

Prices are generally off and there is no prospect of their improving with the present industrial situation of the country and light export, Lake and general demand. There is a good call for prepared sizes from retailers who are not equipped to screen mine-run coal and due largely to the fact that there is still no great amount of coal being prepared by operators.

The best demand experienced in eastern Kentucky is for gas coal. There is some movement to railroads, also a straggling lot of small orders coming from numerous sources. Public utilities in some instances are taking chances on future deliveries and using up stocks of high-priced coal on hand.

It is pointed out that this general tendency to use up high-priced stocks and replace with cheaper coal may result in better demand a little later in the season, especially if bad weather forces heavy consumption.

Eastern Kentucky block is very firm at prices ranging $6@$9, with very little to be had under $7.50 except from big companies to old customers. Screenings are quoted $3.25@$4.50; mine run, $4@$5.50, depending on quality.

Top prices for good eastern Kentucky gas are now around $5.50. On big orders and contracts it is reported this can be obtained as low as $4, some recent contracts having been closed at $4@$4.25 for six and twelve months.

A fight on inadequate transportation conditions has been launched, and it is felt that it is up to the L. & N. to improve the eastern Kentucky lines to supply present shippers instead of spending surplus in buying up feeders and connecting lines.

BIRMINGHAM

Market Is Fair for Good Steam Grades —Domestic Demand Brisk—Car Shortage Again Becomes Serious — Prices Remain Firm — Labor Supply Is Now Adequate.

A fair market prevails for all steam coal of the better grades that is available for the spot trade, in fact the demand is sufficient to absorb more than offered the past week, and this condition resulted in more ease in moving low-grade steam fuel, which has been sluggish. Railroads and furnaces have placed orders for considerable tonnage for delivery between now and the Christmas holidays, to supplement their supply from other normal sources and enable some stocking. Back Creek and Cahaba mine run are quoted $5@$6; Carbon Hill, $4.25@$4.50; Corona, $4.50 @$4.75; Big Seam, $4@$4.25 per net ton mines.

There has been little or no relief afforded the domestic supply from this class of operations, receipts at local yards and throughout the territory being diverted to consumers' cellars as fast as unloaded. Coal men are urging mine run for domestic use, but buying of this grade has not received much impetus as yet, but undoubtedly affords the only means of relief in sight. Lump prices at mines range $4@$6 per ton.

The Southern and L. & N. lines were considerably short on coal cars for the mines last week and operations were interrupted to some extent. The L. & N. has been attempting to make a more even allocation of its coal-carrying equipment in the several coal fields served and has taken a large number of cars out of the service here in carrying out this plan. Other lines have furnished good car supply.

The labor situation is now little affected by the prolonged strike and large numbers of union men have been placed at work during the past week. Influx of labor from farms and industrial operations, which have closed down or adopted short schedules, is now too great for absorption in the mining industry.

Southwestern

KANSAS CITY

Domestic Prices Are Weaker—Operating Conditions Are Satisfactory — Byproduct Coal in Good Demand.

During the past week there has been a leveling of prices throughout the Southwest territory and Arkansas smokeless is now held at $6.75 for lump and $5.25 for mine run. Kansas domestic grades are $6 and steam, $4.50@ $4.75. Missouri domestic grades range $6 and steam $3.55@$5.50.

Mines have had good running time, car supply being adequate and transportation uninterrupted. The weather has been unusually warm and demand has slackened off materially. Mines, generally, in the Southwest, have had good running time throughout the summer and fall months, and the ultimate consumer has profited by past experience and put his coal in early.

There is still some shortage of Arkansas smokeless suitable for byproduct coke plants. This class of trade is new to the Southwest, as Arkansas coal had not previously been used in byproduct plants, but a trial demonstrated its entire fitness for that purpose when shipped from mines producing coal of a low-sulphur content.

Western

SAN FRANCISCO

British Columbia Coal Coming by Water—High Freight Rates Cause the Change.

Shipments of coal from Comox, B. C., are to be resumed. For two years past nearly all of the coal for the San Francisco day district and for bunkering purposes has been shipped by rail from Utah. The change has been brought about by the high freight rates, put into effect some months ago. In years gone by between 500,000 and 600,000 tons of coal were shipped to this port annually from British Columbia mines. Quite a large quantity of coal was also imported from Australia.

The combination of high freight rates and available ocean tonnage resulted in the switch to water transportation. Numbers of freight steamships owned by the United States Shipping Board will be employed in bringing the coal.

News From the Coal Fields

Northern Appalachian

PITTSBURGH

Car Supplies Adequate — Industrial Consumption Continues To Decline — Spot Prices Lower Again.

The suspension of all priority orders as to car supplies at coal mines Dec. 1 has not had an appreciable effect upon the mines as railroads are much less busy with other freight than they were a few weeks ago. Car supplies are still well below mine ratings, but the decrease in demand makes the supply sufficient at most mines.

Slump in demand for coal by the industries has continued. The independent steel mills are hardly operating at an average rate of 50 per cent, while it looks as though many would be closed entirely during the last fortnight of the year. Byproduct ovens, however, are operating quite well and present indications at least are that there will be no great curtailment in that direction, though certainly there will be some. Demand for domestic coal continues good.

There has been a rather sharp reaction in the past week from the advance that began three weeks ago, and prices in the spot market are now fully as low as they were a month ago, if not lower. Steam coal of ordinary grade is readily obtained at $4, while screened gas coal brings $4.50@$4.75 according to grade. In byproduct coal there is a wide range. Some is said to have been offered at $4.25 but it is held that really good grades would command as much as gas coal, if not more. Prices quoted are per net ton at mine, Pittsburgh district.

UNIONTOWN

Both Markets Soften—Steam Coal Business the Only Feature—Coke Contracts Are Being Discussed.

Both coal and coke markets are decidedly soft. Sales are subject to individual agreement, with an average price of $3.75@$4 prevailing for coal and $7.50 for coke. Because of the difficulty operators and jobbers are having in disposing of tonnage already produced it would not be surprising if some sales had been made below those figures.

Virtually the only market for coal is line shipments for steam purposes. Few jobbers are now handling byproduct coal as such and when sales are made they conform in price to steam. With the Lakes closed to traffic and few export buyers in the market demand has slumped to the point where operators and jobbers are seeking to place as much tonnage as possible among their regular customers.

Discussion has commenced with regard to coke contracts for the first half of 1921. It would appear that contracts will be late in closing, neither producer nor consumer showing any haste in binding himself because of the extreme uncertainty of the market. Present conditions, however, undoubtedly will have a bearing on first-half contracts.

Contracts for the last half of the year generally were made upon a ratio of four to one. With pig iron now at $35 contract coke is moving at $8.75, ovens, a figure considerably above the market price. Before the war the ratio was generally five to one but during the days of acute coke shortage a shift was made in the producers' favor. Coke consumers will probably seek to establish the old five-to-one ratio or better in first-half contracts.

CENTRAL PENNSYLVANIA

Prices a Trifle Lower—Car Placement Is Good—Labor Situation Satisfactory.

Coal prices in the central Pennsylvania field have dropped a little lower than last week, ranging from $4.25 for the lower grades to $5 for the better coals. Retail dealers in Altoona are maintaining an average price of $8, with some selling low at $7.50, while others are asking up to $9.

Car supply has been fairly good for the month of November. The mines reached by the Pennsylvania lines in the eastern region were well supplied. Farther west in the central portion the car situation could have been better. A maximum production now depends on the car supply.

Production in the month of November proved to be satisfactory. Up to and including Nov. 27, 81,427 cars were loaded in the district as compared with 80,834 in October. The total output for the month will exceed 5,000,000 tons. With the exception of the mines at Morrisdale, Clearfield County, where a strike is in progress, work is proceeding satisfactorily everywhere.

FAIRMONT AND PANHANDLE

Fairmont Production Cut by Car Shortage—Holiday Idleness Further Affects Output—Prices Decline With Sluggish Market.

FAIRMONT

A marked car shortage, coupled with the Thanksgiving holiday, was responsible for a decline in the output for the week ended Nov. 27. Open-top cars were evidently being diverted for uses other than coal transportation.

Such Lakes shipments as were made moved under special permit and had entirely ceased by the end of the week. Prices reached a still lower level, mine run selling soft at $4.

NORTHERN PANHANDLE

Transportation conditions were generally improved, except as to points on the C. & P. Division of the Pennsylvania, where movement has been poor for the last few weeks.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

Total bituminous, including coal coked

	1920		1919 *a*	
	Week	Calendar Year to Date	Week	Calendar Year to Date
Nov. 13 *b*	12,132,000	476,525,000	4,024,000	409,368,000
Daily average *c*	2,128,000	1,771,000	671,000	1,517,000
Nov. 20 *b*	11,721,000	488,246,000	5,344,000	414,712,000
Daily average	1,953,000	1,775,000	891,000	1,503,000
Nov. 27 *d*	11,416,000	499,662,000	5,334,000	420,046,000
Daily average *e*	2,174,000	1,782,000	956,000	1,492,000

(*a*) Less one day's production during New Year's week to equalize number of days covered for the two years. (*b*) Revised from last report. (*c*) Counting Armistice Day, November 11, 1920, as 0.7 of a working day. (*d*) Counting Thanksgiving Day as 0.25 of a working day. (*e*) Subject to revision.

ANTHRACITE

	1920		1919 *a*	
	Week	Coal Year to Date	Week	Coal Year, to Date
November 13	1,753,000	53,873,000	1,880,000	57,610,000
November 20	1,975,000	55,848,000	2,055,000	59,665,000
November 27	1,692,000	57,540,000	1,759,000	61,424,000

(*a*) Less 2 days' production during first week of April to equalize number of working days covered for the two years.

BEEHIVE COKE

United States Total

Week Ended				
Nov. 27 *c* 1920	Nov. 20 *b* 1920	Nov. 29 1919	1920 to Date	1919 *a* to Date
368,000	365,000	446,000	19,187,000	17,882,000

(*a*) Less one day's production during New Year's week to equalize number of days covered for the two years. (*b*) Revised from last report. (*c*) Subject to revision.

Prices eased off slightly, ranging $4.25@$4.75 for mine run. There was a general lack of demand in the export market, although it was impossible to ship much coal East, owing to embargoes.

CONNELLSVILLE

Spot Coke Resumes Decline — Contract Negotiations Remain in Preliminary Stage—Furnace Ovens Increase Output.

A large sale of furnace coke at $8 softened the market instead of stiffening it, and some sales have been made at $7.50. At this writing, the latest important sale reported is one of 1,000 tons, which went at $7.25, though $7.50 may not have disappeared entirely.

Spot foundry coke has softened about 50c. Many sales have been made at $8.75 to the consumer by brokers who paid operators $8.50. For a few very well-known brands higher than $9 might possibly be obtained.

Negotiations on furnace coke contracts for the first half of 1921 are still in the preliminary stage. While operators display an unwillingness to name final figures it is no secret that the furnacemen would be indisposed to close no matter what terms were offered, as there is no market at all for pig iron and furnacemen have no occasion to cover on raw materials. Ratio contracts are being talked of by furnacemen at 5 to 1, while it is claimed operators are not yet ready to accept such a ratio.

Very little is being done in foundry coke contracts. One prominent operator is offering on contract for the half year at $10, but buyers are not taking hold. The same operator some time ago made some contracts at $15, and the $10 quotation now may be made with an eye to readjustment of those contracts.

The spot market is quotable $7.25@$7.50 for furnace and $8.50@$9 for foundry, per net ton at ovens.

The *Courier* reports production in the week ended Nov. 27 at 212,420 tons, the increase of 12,060 tons being practically altogether on the part of the furnace ovens.

Middle Appalachian

LOW-VOLATILE FIELDS

Export Market Joins the General Price Decline—Domestic Is Easily Moved—Production Limited by the Holiday—Contract Movement Is Heavy.

New River and the Gulf

Production was forced downward in the New River field during the week ended Nov. 27, by Thanksgiving Day and its subsequent idleness. Car supply remained at its unsatisfactory figure of 30 per cent or little better.

Export prices were depressed to $7.50 by the low foreign demand. Steam sold at $5.50, while domestic ranged $5.50@$6.50. Even though there was little spot demand, operating conditions were not affected, as the entire output was utilized in filling orders of regular customers.

Winding Gulf tonnage was again seriously cut by car shortage on the C. & O. which road only laid down a 30 per cent supply. Virginian Ry. mines fared better, with 65 per cent placement. Thanksgiving Day idleness, from which the mines had not fully recovered at the end of the week also added to the loss of production.

There was no spot coal available, all available tonnage being shipped on contract. Operators are supplying local towns on the Virginian at $4.50@$4.80 and emergency coal for the state of Virginia at $4.50@$5.50.

Pocahontas and Tug River

In the Pocahontas region production was limited by the holiday labor idleness and low car supply of 60@70 per cent furnished by the N. & W. General market conditions were much the same as during the preceding week. Prices remained unchanged, about $5@$5.75 for mine run and export $7.50. However, foreign buying was not at all brisk and shipments were largely confined to contract. Production losses attributable to "no market" have not yet made an appearance.

While Tug River production increased slightly in the week ended Nov. 27, it was not more than 60@70 per cent of maximum.

There was a fairly strong demand for domestic, otherwise the market was quiet. Mine run ranged $5.25@$6, with export $7.50. Contract deliveries were heavy.

HIGH-VOLATILE FIELDS

Production Declines with Holiday Losses — Poor Transportation Conditions Affect Car Supply.

Kanawha

Congestion on the C. & O. during the last week in November reduced the car supply to about 50 per cent of normal. Production was especially light during the latter part of the week, caused by Thanksgiving Day and its attendant idleness. Transportation conditions on the Kanawha and Michigan were improved.

Domestic coal was in brisk call, but the weak spot steam demand was for the most part confined to Western points. The C. & O. embargo on Eastern movement was still keeping Kanawha coal off the Tide market and materially interfering with contract deliveries.

Mine run was quoted $4.50@$5; prepared sizes, $7.

Northeast Kentucky

Despite holiday losses production gained 10 per cent, reaching 54 per cent of capacity. An improved car supply enabled operators to offset holiday losses.

Gas coal was the only feature of the spot mine run market, as the general steam depression had made steam difficult to move. Domestic fuel was easily sold and the larger operations are again screening coal, apparently realizing the fact that mine run may be sluggish for some time to come. Prepared coals were generally quoted $7; mine run, $4.25@$6, according to grade.

Logan and Thacker

A very pronounced car shortage and the Thanksgiving lull curtailed the Logan output. Engine failures were responsible for a poor movement of loads and empties, the C. & O. being unable to use all cars returned by connecting lines.

The spot market was dull. However, the decreased production was barely sufficient to care for old business and but little free coal was being offered. Eastern and Tidewater shipments were practically out of the question with an embargo still in force.

Mine run averaged about $5 and prepared sizes up to $7.50. Such coal as could be sold for Tidewater delivery brought about $6.50.

Production had reached 60,000 tons during the first half of the month, a substantial increase over the same period in October. With the field under military rule it is hoped that conditions will soon begin to approach normal.

Steam prices ranged $4.50@$5; prepared sizes were in better demand at $7.50, yet little lump coal was being made. Shipments were largely to Western markets. Wagon mines are largely closed down because of the low price for mine run.

Virginia

Production declined during the week ended Nov. 27, losses reaching 30 per cent, of which fully 20 per cent were due to car shortage. The holiday idleness caused an increase in labor losses. At the outset of the first week of December, it was apparent that car supply would not average 60 per cent.

Demand for all grades was extremely sluggish. Prices remained practically unchanged. Operators are running behind on contract deliveries, due to the shortage of equipment.

Middle Western

MIDWEST REVIEW

Mild Weather Cuts Domestic Demand—Steam Market Is Soft—Only Best Coals Are Readily Saleable—Operating Conditions Good.

On account of the continuation of mild weather the demand for domestic is easing up very considerably. Those who have domestic coal for sale are now finding it fairly difficult to place unless the coal they are offering happens to be a standard product known to the industry for the excellency of its quality and preparation.

Some interesting developments are taking place in both the steam and domestic markets. Salesmen who have been out on their territories in an endeavor to sell coal find that buyers are in an unfriendly frame of mind. One man who buys a considerable

quantity of domestic coal, recently told a salesman that he was through with buying from jobbers, no matter what the circumstances. He gives as an example the fact that he bought a car of Indiana lump coal sometime back and paid a very excessive price for it. When the car arrived he found that it was but little better than mine run and of exceedingly poor quality. This buyer said that he took the matter up with the jobbers from whom he bought the coal and was promised a reduction in price provided they could get the shippers to take a part of the loss. It developed that the car had passed through the hands of three jobbers before it reached its ultimate destination, consequently the buyer had a poor chance of getting an adjustment on this particular shipment. This buyer, who is, by the way, a very influential man and well known to both operators and jobbers, went on to say that from now on he is through with buying anything but the better grade coals produced by companies who have a reputation to maintain. This is a typical example of the frame of mind of the average buyer of domestic coal.

According to latest advices the car supply at Illinois and Indiana mines continues to be satisfactory. In fact, some of the mines are receiving more cars than they can use and "No Bills" have been reported at more than one operation. Labor at the mines is satisfactory. The men are working hard and are showing a far more reasonable state of mind. Labor is very plentiful and nearly every mine in Indiana and Illinois have as much labor employed as they can use. The railroads are improving slowly but surely and after a lapse of some time are now giving reasonably good service to the public.

It is expected that when the cold weather comes, and its arrival is due any time, the market on both domestic and steam sizes will be strengthened materially. The industrial depression that swept over the Middle West reached its heights a few weeks ago and it is expected that factories will begin to open up in the near future and that conditions will be very much improved immediately after the holidays.

DUQUOIN

Operating Conditions Are Good — Domestic Demand Is Steady, but Steam Prices Shade Off — Good Northern Movement.

A marked increase in car supply and a steady demand were most noticeable during the week just ended. Also a slight change in the attitude of the miners was shown in certain parts of the region. Coal moved with more speed than has been observed for some weeks. This is due partly to the warm weather which still hangs on.

Large shipments are moving toward the Northwest. The Chicago territory as well as St. Louis is also receiving a large per cent of the output. However, a heavy depression is plainly noticed on steam sizes, while lump is more keenly in demand. Production averaged 85 per cent for the week. This is a large increase over the last two weeks.

Practically all mines have caught up with their contracts and many are now selling 80 per cent of their coal on the open market. Screenings weakened with a top price of $3.25@$3.50; mine run ranged $3.50@$4; lump was steady at $4.

WESTERN KENTUCKY

Car Supply Increasing and Demand Is Holding Up Nicely — Operators Well Satisfied with Conditions — Prices Are Steady.

Operators feel more than satisfied with the way the output has been maintained as well as price, in reviewing conditions existing during the past two or three weeks, during which time general bituminous markets have felt the effect of reduced industrial activity. Western Kentucky is having no trouble in disposing of production at good prices. Lump coal continues in good demand, while steam and screenings are holding their own fairly well.

Early this week operators were quoting spot lump at $5@$6.75, which is about on a par with last week. Mine run is quoted $4@$5.25. Screenings are selling $3@$4.50.

Car supply in western Kentucky is running 69 per cent on the I. C. R.R., and 56 per cent on the L. & N. The O. & N. division of the L. & N is still making a sorry showing, it being the poorest division on the line so far as car supply is concerned, the division not being equipped to handle heavy tonnage.

Western Kentucky, like all other fields supplied by the L. & N. R.R., has grown rapidly, there being an increase in production of 50 per cent between 1912 and 1918, but no improvement in transportation facilities or in through rates except where the carriers have been forced to come across through efforts of the coal traffic bureaus.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Car Supply Is Improved — Domestic Market Strong, with Little Tonnage Available — Steam Coal Is Not Marketed Easily.

From abnormal production losses because of a protracted car shortage, operators are fast approaching the point where a curtailed output will be chargeable to "no market." Producers are again taking to the road for the first time in many months and are pushing their sales.

Demand for steam is extremely light and some little effort is required to move current production. Gas coal is in better call. The domestic market is still good but the majority of operations are not equipped to make prepared sizes.

A better run of cars has been experienced lately. It is said that the L. & N. R.R. is receiving a larger number of its cars that have been off the line in Lakes business and will be able to give better placement, temporarily at least.

Prices range $4@$5.50 for mine-run, gas coals bringing in the higher figure, while on steam the price shades down with the quality. Some contracts are being made on high-grade coals at $4@$4.25.

Western

WASHINGTON

Domestic Demand Is Slack—Consumers Await Lower Prices—Jam Seen in the Event of Cold Spell.

Harold N. Moore, secretary of the Seattle Retail Fuel Merchants' Association, declares that never has the November demand for fuel been so slack as this year.

Three things are responsible for the peculiar situation. First, abnormally mild weather; second, the fact that unusually large purchases were made last summer when an early buying campaign was conducted at the request of the government, and third, a feeling among consumers that coal, like many other commodities, is going to "come down."

The only cause for worry among the coal dealers is that a sudden cold snap will find householders with little coal on hand and that the trade will be swamped with orders that cannot be filled without delay.

Mines are producing coal in plenty and dealers have large stocks on hand, but the distributing system can easily be overtaxed, as it has been occasionally in the past, thereby causing annoyance and discomfort.

There is no basis for the belief that coal prices will be lower soon. Miners' wages have been fixed by a contract that has more than a year to run, railroad freight rates are not at all likely to be revised downward and costs of distribution also are now as low as consistent with service and cannot well be reduced.

UTAH

Retail Stocks Adequate, Despite Lowered Production — Final Rate Hearing Set for Dec. 13.

Despite a car shortage which has curtailed the output 25@50 per cent of late, the retailers report no shortage of coal. This is largely due to the mild weather which has prevailed.

Lake conditions are good. Skilled miners are still in demand, but production losses from a labor shortage have been much reduced of late.

The rate dispute between the Utah Public Utilities Commission and the Interstate Commerce Commission will be gone into again on Dec. 13. This will be the final hearing.

MINE And COMPANY NEWS

ALABAMA

Ten miners, eight white men and two negroes, recently met death as a result of an explosion from ignited gas in the mine of the **Railway Fuel Co.**, at Parrish, Walker County. Six of the men were instantly killed ,the other four dying enroute to hospitals. In addition to the killed, three white men and two negroes were more or less seriously burned by the flames. The mine had been closed about a week due to labor troubles and had just resumed operation and according to official information there were 160 men under ground at the time of the accident and the gas was set off by an employee entering a room which had been "marked off." Property damage was reported as slight.

COLORADO

Gross and net earnings of the **Colorado Fuel and Iron Co.** for the third quarter of 1920 show large gains over the corresponding period of last year but a considerable decrease from those of the previous quarter, according to the statement as of Sept. 30, just issued. The balance for the quarter, after all charges except preferred dividends, was $691,685, bringing the net income for nine months of the year up to a total of $2,659,133, compared with $1,572,637 for the same period of last year. This is equivalent, after the payment of preferred dividends to $7.30 a share earned on the common in the nine months. The common dividend is 3 per cent.

ILLINOIS

The Illinois Coal and Coke Co. is preparing to open the old Lefton mine, near Auburn, which has not been worked for a number of years. The Chicago and Alton R.R. is arranging to relay several hundred yards of trackage leading to the coal mine.

The Mitchell-Hopkins Coal Co. has been incorporated with capital of $25,000 to engage in general retail coal business, the yards to be located at Seventeenth Street and Second Avenue, Rock Island.

About 150 miners were rescued from the **Crescent mine** near Peoria after fire had trapped them for over an hour. The fire was caused by a spark from a circuit-breaker. The miners crawled to safety by an escapement in another part of the mine. Several were overcome by smoke. The fire did considerable damage to the mine.

INDIANA

The English-Princeton Oil Co., which has done well with oil and gas leases in Crawford County, has opened a mine on the Henry Wright lease, where it has a 48-inch vein which is being worked. Shipments have already started.

IOWA

Iowa coal production is approximately 50 per cent greater for 1920 than it was for 1919, with consumption practically keeping pace with production. During the first ten months of the year, 6,470,000 tons of coal were mined in the state and it is estimated by officials of the Iowa Coal Operators' Association that 1,300,000 tons will be produced during the last two months of the year.

KENTUCKY

The Landram Coal Co., Harlan, recently organized with a capital of $125,000, is planning for the construction of a coal tipple at its properties at Arjay. A housing development to include about 25 miners' residences will also be constructed. C. F. Wheeler is secretary.

Some recent incorporations in Kentucky are: **Mineiga-Harlan Coal Co.**, Harlan, capital $45,000, M. I. Bowen, Nelson Cory and G. A. Smith. **Delaware Coal Co.**, Delaware, $15,000, T. H. Jennings, Dr. I. D. Crosby and R. S. Jennings. **The Vinson-Kolb Coal Co.**, has filed amendment, increasing its capital from $40,000 to $100,000, at Louisville.

MONTANA

Montana Mines are trying metal helmets for workmen as a safety device. Scores of the helmets have been distributed by the safety department of the **Anaconda Copper Mining Co.**, Butte, and if the experiment proves a success a supply sufficient for all miners will be obtained and sold at cost, it is announced. These helmets are somewhat similar to the trench helmet used in France, but they weigh only seven ounces. Much of the injury in mines is caused by falling tools and small rocks. The hats, it is believed, will resist or turn such objects.

MISSISSIPPI

The Mississippi Oil & Gas Co. of Ackerman, Mississippi, in the North Central part of Mississippi, has recently leased 2,000 acres of semi-bituminous coal, and clay land, to Jno. W. O'Bannon and S. W. Kendall, well known engineers; it is believed these men intend to fuel the Gulf, Mobile & Northern Railroad.

MISSOURI

A federal grand jury investigation of coal prices in Kansas City has been ordered by Federal Judge Arba S. Van Valkenburgh. The court's order to proceed with the investigation began several months ago by agents of the Department of Justice after Judge Van Valkenburgh upheld the constitutionality of the Lever act under which the probe is being conducted. Coal dealers and operators whose books the federal agents sought to examine made an effort to halt the proceedings on the ground that the Lever act was unconstitutional.

OHIO

The authorized capital of the **Shadyside Coal Co.** of Bellaire, has been increased from $30,000 to $50,000.

The Silver Ridge Coal Co. has been incorporated at New Lexington with a capital of $200,000 to mine and sell coal. Incorporators are J. Paskell, W. V. Bybee, A. W. Paskell, L. Paskell and M. E. Paskell.

PENNSYLVANIA

The Hillman Gas Coal Co., of Pittsburgh, has contracted with Roberts and Schaefer Co. for the complete machinery equipment for their new Bentleyville shaft tipple. In this equipment will be included weigh hoppers, loading chutes, and Marcus picking table screen. **The Diamond Coal & Coke Co.** has contracted with the same company for the installation of an additional Marcus screen to be installed in their tipple at Barking Station, Pa.

Fire of an undetermined origin totally destroyed the tipple of the Alicia No. 1 plant, of the **Pittsburgh Steel Co.** at Alicia. A considerable amount of coal was also burned. The loss will be about $100,000. Five hundred men will be idle as a result of the fire. The work of reconstructing the tipple has been started.

The Willcett Coal Co., Pittsburgh, is being organized by Harry H. Wolfe, John A. Williams and Robert C. Johnston to operate coal properties in certain Pennsylvania districts. Application for a state charter will soon be made.

Charles F. Roy of Somerset has purchased a tract of land in Somerset county containing 19 acres of the famous Listie coal from the George F. Baer estate. Through this deal, Mr. Roy and his brothers, Rob Roy and James Roy take rank among the largest independent mine operators in Somerset county.

WEST VIRGINIA

The Ureka Coal and Mining Co., Huntington, has filed notice of an increase in capital from $200,000 to $400,000.

The Wheeling Steel Corporation, Wheeling, has acquired 1,200 acres of coal lands in the Mason County, and is planning for its development at an early date.

The Osage Coal Co., Morgantown, has acquired 38 acres of coal lands in this vicinity for a consideration of $23,000.

The North Fairmont Coal Co., North Fairmont, has construction under way on the housing development at its mines. The structures will be two-story, 22 x 24 ft. and the project, including the installation of plumbing, heating and lighting, is estimated to cost about $100,000.

The New River Coal Co., MacDonald, has awarded a contract to the Austin Co. Union Arcade, Pittsburgh, Pa., for the erection of additions at its mines to be used as a machine shop, and warehouse.

The Monticello Smokeless Coal Co., Monticello, has construction under way on its new steel coal tipple and head house on a local site.

The Right Fork Mining Co., Ivaton, organized with a capital of $200,000, has acquired the property of the Right Fork Coal Co., and is perfecting plans for its improvement. The monthly capacity is to be increased from 200 to 3,000 tons. J. H. Moore, Huntington, W. Va., is president.

H. J. Booth and associates have acquired about 1,029 acres of coal lands in the Monongahela County district for a consideration said to be about $360,000.

The Beckshad Smokless Coal Co., Daniels, organized with a capital of $25,000, has acquired 200 acres of coal property and is having plans prepared for its development. A daily capacity of four cars of coal is expected.

The W. C. Williams Fuel Co., New York, has acquired an option on 500 acres of coal property in the vicinity of Farmington, and it is understood that arrangements for its development are being perfected.

BRITISH COLUMBIA

The production of the **Vancouver Island (B. C.) Collieries** for the month of October shows a marked increase. It is apparent that all the companies are speeding up their output in order to meet increased domestic and bunker demands.

Following are the figures for the Island Collieries for the past month:

	Tons
Canadian Western Fuel Co., Nanaimo	60,582
Canadian Collieries (D) Ltd., Comox	43,390
Canadian Collieries (D) Ltd., South Wellington	9,062
Canadian Collieries (D) Ltd., Extension	17,593
Pacific Coast Coal Mines Ltd., S. Wellington	7,610
Nanoose Wellington Collieries, Nanoose Bay	6,460
Granby Consolidated Mng. & Smelting Co., Cassidy	21,703
Total	166,400

The production of the Crow's Nest Pass Coal Field, B.C. for the month of October was as follows:

	Tons
Crow's Nest Pass Coal Co., Coal Creek	22,058
Crow's Nest Pass Coal Co., Michel	11,504
Corbin Coal & Coke Co., Corbin	14,678
Total	48,240

Traffic News

A number of coal interests are represented in **the Illinois rate case** which will be heard by the Commission on Dec. 13. The Commission last week decided that the intrastate passenger and Pullman rates must equal the interstate fares, and the question of freight rates will be considered at this hearing. Coal interests represented in the case are: Indiana Coal Trade Bureau; Central Illinois Coal Traffic Bureau; Coal Operators Assn.; Illinois Coal Traffic Bureau; Old Ben Coal Corporation; Spring Valley Coal Co.; Illinois Third Vein Coal Co.; Wenona Coal Co.; La Salle County Carbon Coal Co.; B. F. Berry Coal Co.; 5th and 9th Districts Coal Bureau and the Coal Trade Bureau of Illinois.

The case involving **coal rates to Atlanta, Ga,** via Cartersville and W. & A. Ry. has been assigned by the Commission for hearing at Atlanta Dec. 8.

An order just issued by the **Dominion Board of Railway Commissioners** empowers provincial fuel administrators to fix, in case of need, the maximum prices at which all classes and grades of fuel may be sold within a municipality. A general survey is also being made of the available coal supply in the various sections of Canada, to guard against local shortages.

The Denver & Rio Grande Rd. and the Utah Coal Road have filed an agreement to operate and maintain jointly the double tracks between Provo and Thistle. The second track was built by the Utah Coal Road and was used by the Denver and Rio Grande until about two years ago. The contract specifies that each company shall pay the other on a wheelage basis for the number of cars that pass over each others tracks, and have agreed to pay each other 6 per cent interest on the actual cost of the construction of the grades.

The Virginian Power Co., of Charleston, which furnishes power to mines in Cabin Creek district, Charleston and the Kanawha valley, has applied to the public service commission for an industrial rate. The rate asked would double the rate in effect in 1917. The company was granted an increase several months ago. The representatives of the company claim that no money is being made under the present schedule An increase in electric rates also was asked for its Mingo and McDowell County operations by the Kentucky and West Virginia Power Co.

Much is expected of the Mississippi River as a rate equalizer on coal costs. At a meeting of the **Upper Mississippi Waterways Association** in Minneapolis it was estimated an annual saving of $40,000,000 may be made by shipping coal up the river from Illinois and Indiana by barges, figuring the present freight at $3.75, and the barge cost, 3,000 tons to the barge, six in a string, towed, at 75c. a ton, with hauling charges from the mines to the river and handling charge of around 25c. or a total of $1. Evidently the figures cover a tonnage of 14,000,000, tons, which is rather high.

Association Activities

Morgantown Coal Operators' Association

Claiming that the business and life of its members are at stake. the Morgantown Coal Operators' Association has renewed its fight before the Interstate Commerce Commission to secure just treatment at the hands of railroads, it is asserted. There are a number of companies belonging to the association who for several years while not owning tipples yet have been loading coal over tipples on private tracks.

Under Sevice Order 14 the Pennsylvania and New York Central systems classified the mines of members as railroad mines but the B. & O. refused to take such action unless a siding was used exclusively by one mine or company.

In September the Association took the refusal of the B. & O. to furnish cars up with the Interstate Commerce Commission and the commission promulgated an order requiring the railroad to furnish open-top cars and also requiring that such cars be loaded in twenty-four hours.

So far the railroad has refused to pay any attention to the latest order of the commission and the Morgantown association is again taking the matter up with the commission. Threat is made of damage suits to follow because of the failure to get cars since August and the resulting loss of business.

Monongalia Coal Operators' Association

Operators belonging to the Monongalia Coal Operators' Association at a meeting held at Morgantown, West Virginia, made it plain that they will demand of the railroads responsible for a shortage of 20,000 cars on the Monongahela Railway the sum of $100,000 as compensation for the loss of business as even if the car shortage prevailing over the period of a year and due to an inequitable distribution of cars, it would not suffice to compensate the operators for their loss owing to low prices now in force.

Northern West Virginia Operators' Association

Geo. T. Bell, secretary and executive vice-president of the Northern West Virginia Operators' Association, presented to the Interstate Commerce Commission at Washington on Nov. 20 the case of the operators on the Monongahela and Morgantown & Kingwood railroads against the director general of railroads for compensation for a car shortage accruing during a period of federal control.

The association first asked that the shortage of 20,000 cars between July 1, 1919 and March 1, 1920, be made, but the plea was changed on Nov. 20, the association requesting that individual operators be compensated instead for loss of business. It is charged that during the period previously alluded to both the Pennsylvania and the Pittsburg & Lake Erie who jointly own the Monongahela, furnished a larger percentage and a better supply to mines on their own line than to mines on the Monongahela and the Morgantown & Kingwood.

Not only did a shortage of 20,000 cars accrue during the period already mentioned but in the six months of quasi-control after March 1, a shortage of 12,000 cars accrued and therefore it is argued the Interstate Commerce Commission had jurisdiction in both cases.

Clarksburg Coal Club

It developed during a recent meeting of the Clarksburg Coal Club that operators of northern West Virginia are not very well satisfied with the management of the Tidewater Coal Exchange, claiming that the influence of the jobbers is so dominant that it gives them virtual control of coastwise and export shipments.

The Exchange determines to just what pools coals from various sections shall be sent, the producers of northern West Virginia having no say, it is asserted, as to just how their coal shall be classified. J. M. Orr, a member of a special committee appointed to investigate the administration of the affairs of the Tidewater Exchange, told just what he had found.

Associates of Mr. Orr on the special committee were S. D. Brady of Fairmont and E. Drennen of Elkins. It was rather plainly indicated by Mr. Orr in his talk to the Clarksburg Coal Club that unless the operators had a larger representation on the board of the Coal Exchange they would be slow to become members although many operators favored the object for which the exchange was created.

Industrial News

Pittsburgh, Pa.—Blaw-Knox Co., Blawnox, has established a new sales district in the South, with headquarters in Birmingham, Ala.

Prescott V. Kelly, formerly connected with the executive sales department at Pittsburgh, is in charge of the new office.

Cincinnati, Ohio—The Raleigh Smokeless Fuel Co. have opened a branch office. Walter D. Mills has been placed in charge as branch manager.

New York, N. Y.—The Cutler-Hammer Mfg. Co. has recently acquired new property in New York City, as an additional plant for the manufacture of "Thermoplax" and "Pyroplax" molded insulation.

Philadelphia, Pa.—Fairbanks, Morse & Co. have purchased the entire business consisting of all stock on hand, good-will and liabilities of the Luster Machine Shop and Railway Equipment Co. Fairbanks-Morse have opened a new branch at this address under the management of Mr. D. W. Dunn.

Washington, D. C.—The Paymaster General of the Navy in his annual report recommends that the government purchase the land on which its coaling plants are located, particularly in Boston and New York. During the past year the Navy consumed 1,545,000 tons of steam coal at an average cost of $5.90 a ton and 45,000 tons of anthracite at an average of $8.50.

Washington, D. C.—The Bureau of Mines has sent to Congress a deficiency estimate of $75,000 to supervise operations under the leasing law until June 30 next, Congress having made no previous appropriation therefor. Of this amount $10,000 is for supervision of coal, phosphate, oil shale and sodium leases and permits, and the balance for oil and gas lease supervision.

Washington, D. C.—To Nov. 1, there had been filed with the General Land Office 254 applications for prospecting permits for coal involving more than 250,000 acres and 39 applications have been made for coal mining leases involving 75,000 acres. Two coal mining leases have been granted to large coal mining companies and more than 300 coal miners are at work on those leased deposits. The royalty to the Government from these two leases will probably amount to more than $30,000 for the present year

Buffalo, N Y.—The Premier Coal Corporation of New York has opened a branch office here, with H. Snyder, from the home office, in charge.

Buffalo, N. Y.—Weston Dodson & Co., has established a coal office here, appointing as sales agent A. P. Rich, who comes from the home office in Bethlehem, Pa. He has been in this territory for some weeks, but was without an office till now.

Personals

Clifford F. Messinger has been appointed General Sales Manager of Chain Belt Co., Milwaukee, to succeed **L. C. Wilson** who has resigned to become secretary of the Federal Malleable Co. closely associated with the Chain Belt. Co. Other promotions announced are **C. E. Stone,** assistant to the vice president and **J. A. Monahan,** purchasing agent.

Albert H. Hopkins has resigned from the Presidency of the Engineering Advertisers' Association of Chicago, and from the managership of Advertising and Sales Promotion departments of the C. F. Pease Co., Chicago, to become Chicago manager for the J. Roland Kay Co., International Advertising Agents.

Walter D. Stockley, president of the Fairmont Mining Machinery Co., has resigned. His successor is **Frank C. Davis,** who has been the assistant general purchasing agent of the **Consolidation Coal Co.** Mr. Davis' title being that of acting president.

Coming Meetings

American Institute of Mining and Metallurgical Engineers' annual meeting will be held in New York, Feb. 14 to 17 1921. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

Coal Mining Institute of America will hold its annual meeting Dec. 8, 9 and 10, 1920, in the Chamber of Commerce Auditorium, Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Bldg., Pittsburgh, Pa.

The Wholesale Coal Trade Association of New York, Inc., will hold its annual meeting in New York City, Jan. 18, 1921. Secretary, Charles S. Allen, 90 West Street, New York City.

American Society of Mechanical Engineers' annual meeting will be held in the Engineering Societies Building, 29 West 39th Street, New York City, Dec. 7 to 10 inclusive. Secretary, Calvin W. Rice, 29 West 39th Street, New York City.

American Society of Civil Engineers will hold its annual meeting Jan. 19 and 20, 1921, at its headquarters, 33 West 39th St., New York City. Acting secretary, Herbert S. Crocker, 33 West 39th St., New York City.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	—New York—			
	Mill Pittsburgh	Current	One Year Ago	Chicago
Beams, 3 to 15 in.	$2.45@$3.00	$3.80	$3.47	$3.58
Channels, 3 to 15 in.	2.45@ 3.00	3.80	3.47	3.58
Angles, 3 to 6 in., ¼ in. thick.	2.45@ 3.00	3.80	3.47	3.58
Tees, 3 in. and larger	2.45@ 3.75	3.85	3.52	3.62
Plates	2.65@ 4.00	4.00	3.67	3.78

BAR IRON—Prices in cents per pound at cities named are as follows:

New York	Pittsburgh	Denver	St. Louis	Birmingham
4.75	3.63	4.95	4.07½	5.00

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Chicago	Denver	Birmingham	San Francisco
Wire	$3.25	$3.35	$4.45	$5.50	$5.00	$6.45
Cut	None	8@11	....	....	....	8.95

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	Denver	San Francisco	Birmingham
Standard railroad spikes ⅝-in. and larger	$4.00	3.40@4.00	$5.47½	$5.50	$7.75	$5.50
Track bolts	6@6.50	4.60@5.80	Prem.	6.75	8.75	8.50
Standard section angle bars	3@4	2.75@3.40	Prem.	5.05	5.45	....

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland
Round shafting or screw stock, per 100 lb. base	$5.50	$5.90	$6.00
Flats, squares and hexagons, per 100 lb. base	6.00	6.40	6.50

Denver base price is $7.60.

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Chicago	St. Louis	Denver	Birmingham
Straight	$5.75	$7.00	$7.00	$8.15	$7.25
Assorted	5.85	7.15	7.15	8.40	....

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	—Pittsburgh—		—Chicago—	
	Current	One Year Ago	Current	One Year Ago
Standard Bessemer rails	$45.00	$55.00 $45.00	$45.00@$55.00	$45.00
Standard openhearth rails	47.00@	57.00 47.00	47.00@ 57.00	47.00
Light rails, 8 to 10 lb.	2.88@	4.00* 2.585*	2.45@ 3.00*	2.835*
Light rails, 12 to 14 lb.	2.84@	3.84* 2.54*	2.41@ 2.95*	2.79*
Sight rails, 25 to 45 lb.	2.75@	3.75* 2.45*	2.32@ 2.85*	2.70*

*Per 100 lb.

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Chicago	Denver
$0.10	$0.16½	$0.18	$0.12	$0.16½	$0.18

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham	Denver
Solid	12c.	18c.	20c.	....
Hollow, ⅞ hex	17c.	22c.	....	21c.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows: New York and St. Louis

Hercules red stand, all constructions	20%
Patent flattened strand, special and cast steel	20%
Patent flattened strand, iron rope	5%
Plow steel round strand rope	30%
Special steel round strand rope	30%
Cast steel round strand rope	22½%
Iron strand and iron tiller	5%
Galvanized iron rigging and guy rope	+12%

Western and California territory — 20%, plow steel; 22½%, galvanized rigging and guy rope.

CONSTRUCTION MATERIALS

ROOFING MATERIALS—Prices per ton f.o.b. New York and Chicago:

Tar felt (14 lb. per square of 100 sq.ft.) per roll	$3.05
Tar pitch (in 400-lb. bbl.) per 100 lb.	2.25
Asphalt pitch (in barrels) per ton	56.50
Asphalt felt (light) per ton	122.00
Asphalt felt (heavy) per ton	122.00

Common Brick—Per 1000:

Denver	$15.00
Chicago	15.00
St. Louis, salmon	17.00

LUMBER—Price of pine per M in carload lots:

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
St. Louis	$.....	$.....	$56.75
Birmingham	30.00	37.50	32.50
Baltimore	52.50@60	54@60	72.50

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing	—Gelatin—			Black
	20%	40%	60%	80%	Powder
New York	.....	$0.3325	$0.3625	.....	$2.80
Boston	.265	.282	.322	.352	.....
Cincinnati	.2275	.2525	.2725	.....	2.30
New Orleans	.265	.295	.325	.3925	2.90
Seattle	.18	.205	.225	.2925	2.60
Chicago	.2175	.2525	.2975	.34	2.45
Minneapolis	.2272	.2476	.2731	.....	2.90
St. Louis	.25	.285	.315	.3575	2.60
Los Angeles	.22	.27	.31	.....	2.95

MISCELLANEOUS

BABBITT METAL—Warehouse prices in cents per pound:

	—New York—		—Cleveland—		—Chicago—	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Best grade	70.00	90.00	47.00	70.00	45.00	60.00
Commercial	30.00	50.00	18.00	16.50	11.00	13.00

HOSE—Following are prices of various classes of hose:

	Fire	
Underwriters' 2½-in.		75c. per ft.
Common, 2½-in.		40%
	Air	
	First Grade	Second Grade	Third Grade
¾-in. per ft	$0.50	$0.30	$0.25
	Steam—Discounts from list		
First grade	30%	Second grade 40%	Third grade 50%

LEATHER BELTING—Present discounts from list in fair quantities (½ doz. rolls):

Light Grade	Medium Grade	Heavy Grade
30–10%	30%	25%

RAWHIDE LACING—For cut, best grade, 35%, 2nd grade, 40%. For laces in sides, best, 63c. per sq. ft.; 2nd, 62c. Semi-tanned: cut, 25%; sides, 65c. per sq. ft.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$1.00
Asbestos for high-pressure steam	2.00
Duck and rubber for piston packing	1.20
Flax, regular	1.20
Flax, waterproofed	1.70
Compressed asbestos sheet	1.00
Wire insertion asbestos sheet	1.50
Rubber sheet	.50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.60
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.50
Asbestos wick, ½- and 1-lb. balls	1.10

MANILA ROPE—For rope smaller than ¾-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ¼-in., 8 ft.; ⅜-in., 6; ½-in., 4½; 1 in., 3½; 1¼-in., 2 ft. 10 in.; 1½-in., 2 ft. 4 in. Following is price per pound for ¾-in. and larger, in 1200-ft. coils:

Boston	$0.28	Birmingham	$0.32½
New York	.27	Denver	.28½
St. Louis	.26½	Kansas City	.29
Chicago	.27½	New Orleans	.26
Minneapolis	.27½	Seattle	.28
San Francisco	.25	Los Angeles	.28

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING		BLOCKS AND SHEETS	
Pipe Size	Standard List Per Lin.Ft.	Thickness	Price per Sq.Ft.
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2 -in.	.60
6-in.	.80	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05

85% magnesia high pressure — List +5%

For low-pressure heating and return lines — 4-ply 50% off; 3-ply 52% off; 2-ply 54% off